UNCLE ABNER'S LEGACY

A. HYATT VERRILL

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Feeding time

UNCLE ABNER'S LEGACY

BY

A. HYATT VERRILL

AUTHOR OF *The Cruise of the Cormorant, In Morgan's Wake, Harper's Book for Young Gardeners,* ETC.

ILLUSTRATED

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INTRODUCTION

The object of this book is to show what can be accomplished on a small farm by employing modern devices and using scientific methods. There is nothing impossible, nothing purely theoretical about it; everything done by Tom and his sister and cousin in the story has been accomplished on real farms by real boys and girls, and any intelligent, energetic person can do as much or more on any good fertile farm within easy reach of a good-sized town.

In order that the story may be equally applicable to various sections of the United States, Ridgelea Farm has not been located in any definite spot, and its resources have been confined to such as are common to a very wide area of our country. In the Far West, in the South, or in the extreme North, certain of the products described would not be profitable, or even possible, but in each of these sections other resources would be available to take the place of those mentioned. The prices of the various supplies, implements, labor, etc., as well as the amounts received for the products of the farm, are the aver-

age of quotations from reliable sources from various districts, and they may prove somewhat higher or lower than the prevailing rates in certain localities.

Many highly profitable farm products and side industries are sadly neglected by our farmers and agriculturalists and many of these have been touched upon in this book. The story is not intended as a complete handbook of gardening, farming or agriculture, but is written with the idea of pointing out the possibilities of rural life, in arousing a greater interest in modern farm methods and to illustrate the advantages which the scientific, up-to-date farmer possesses over the old-fashioned, conservative tiller of the soil.

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* Courtesy of E. A. Strout Co.

UNCLE ABNER'S LEGACY

CHAPTER I

A MYSTERIOUS LEGACY

"Hurrah, Kit!" cried Tom, as he burst into the little room. "What do you think? Uncle Abner has remembered us in his will."

"Honest?" queried Kitty incredulously—and, without waiting for confirmation, continued: "What is it, his old snuffbox or a haircloth sofa? I don't believe he'd leave us anything else."

"That's where you get left, then," cried Tom. "Uncle may have been a tight-fisted old chap when alive, but he's made up for it in the end. He's left us his farm."

His sister dropped into a chair. "A farm!" she exclaimed. "I don't believe it. Tom Manville, stop your fooling this instant and be serious."

"I *am* serious, Kit," Tom assured her. "Honest Injun. See here, if you don't believe it." He tossed an official-looking envelope into her lap.

Kitty drew forth a sheet of legal cap and, spreading it on the table, read as follows:

"Mr. Thomas Manville:

"SIR.—As executor of the estate of your uncle, the late Abner Bennett, Esq., I have the pleasure of informing you that the property known as Ridgelea Farm has been bequeathed to you and your sister, Miss Kathryn Manville, by the terms of the last will and testament of the deceased. If you will kindly call at my office in company with your sister I shall be pleased to deliver the deeds to the property in accordance with the law. I might add that your uncle's will also mentions a certain package of papers which is to be delivered to you exactly one year to a day after you assume possession of Ridgelea Farm, but under certain conditions which I cannot at present disclose.

"Yours respectfully,
"HENRY MORTON."

"There, now," cried Tom exultingly, as his sister finished reading the attorney's letter, "didn't I tell you he'd left us a farm?"

"It's too good to be true," exclaimed Kitty. "To think that we won't have to work in those stuffy, horrid old offices any more, but can have a real home of our own, with fresh outdoors air and fruit and chickens and eggs and everything."

"Well, we haven't got them to eat now, and I'm hungry," remarked her brother, "so let's have supper and we'll talk it over while we eat."

"But where *is* Ridgelea Farm?" asked Kitty, as she poured the coffee. "I never knew Uncle Abner

had a farm. And what *do* you suppose Mr. Morton means by that package of papers?"

"Search me," answered Tom. "Morton can no doubt tell us where the farm is, but I don't know any more about the package than you do. Perhaps he left the farm to us with a string tied to it—takes it away again in a year, or something of that sort."

"I can't believe he'd do anything as mean as that," cried Kitty. "After letting us live there for a whole year it would be a terrible blow to have to give it up. Why, I'd rather not take the farm at all."

"Don't you believe he'd not be that mean," said Tom. "Uncle Abner would just gloat over such a trick. He'd think it a huge joke. Remember the time I asked him to pay your expenses for a trip south, when you were all tired out with work, and how he wrote back and said hard work never hurt anyone yet, and if you weren't able to pay for your own fun you'd better stay home and work harder. He never wanted for anything himself, though."

"Oh, you mustn't talk that way about him, Tom, now he's dead," expostulated Kitty. "Besides, he worked hard himself, you know, when he was young. Mother often used to say that he was soured against

the whole world because he had such a hard life in his youth."

"Well, I never liked him when he was alive, and I don't like him any better dead—except for leaving us the farm. I don't care if he did have to work hard. He ought to have felt all the more sympathy for us then."

To Tom and Kitty Manville the news that their Uncle Abner had remembered them in his will was almost unbelievable. Ever since their parents had been lost on the *Titanic* they had been thrown on their own resources, and for several years had been supporting themselves—Tom as confidential clerk, and Kitty as stenographer in the office of Mr. Grayson, who had been a friend of their father. Their Uncle Abner, a crusty, eccentric old man, had never offered to help, and when, on one or two occasions, Tom had swallowed his pride and had appealed to his uncle for aid in time of sickness or trouble, the only response had been brief, caustic notes.

"I wonder who he left all the rest of his property to?" mused Kitty, as she cleared the table. "He must have been very rich."

"Some pet charity, probably, or some church. I don't care, as long as he gave us the farm. But, I say, Kit, won't it be fun, raising vegetables and

chickens, and having cows and horses and everything else to look after?"

"I can't think of anything better," agreed Kitty. "But honestly, Tom, how *are* we going to begin? We don't know anything about farming, you know."

"Don't we though?" replied her brother. "I know how to milk a cow, and I can plow and mow grass and hoe potatoes, and I'll bet you can make cream and butter and cheese if you try. I learned a lot about farming when I was visiting Fred Barton last summer. His sister makes all their butter and stuff, and you're twice as smart as she is."

"Perhaps it isn't a very big farm, and we can learn as we go along," remarked Kitty. "But we'll surely need money to live on at first. It's fall now, you know, and we can't raise vegetables and such things."

"Perhaps the place already has things growing on it," suggested Tom. "We can't tell until we see Morton. Besides, we've money in the bank that we can use if we have to. I'm going to tell Mr. Grayson to-morrow that I'll give up my job this week, anyhow."

"I wouldn't do it just yet," admonished his sister. "Why not wait and see the farm and find out all

about it first? We may find it's better to work this winter and move to the farm in the spring."

"I'll tell you what," exclaimed Tom, "let's go to the library and read all the books we can find about farms. There must be some, I'm sure. Nowadays one can learn almost anything from books."

This seemed an excellent plan, and the two lost no time in walking to the public library, where they were soon busily searching the shelves devoted to books on gardening, agriculture and farm life.

"My, but there are lots of books," remarked Tom. "I never knew so much could be written about such a simple thing as farming."

"It isn't half as simple as you think," replied Kitty sagely. "I know by the contents of the books that there's a great deal to learn. But I don't see how we can tell which books to read first."

"Hello!" exclaimed her brother. "Here's a book that just suits our case. It's about raising things for profit, and there's a heap about what boys have done in it."

"We'll start on that, then," declared Kitty, "and we'll take this one home, too. It's about raising chickens."

Armed with the two volumes they returned to their rooms and spent the rest of the evening poring

over the books. At first Tom was inclined to consider his book uninteresting, but after a time remarked: "What we don't know would make a bigger book than this," adding a little later that "if farmers have to remember all these things I should think they'd go crazy." Not until he had finished the book did he lay it aside and, yawning, exclaimed: "Well, I hope our farm isn't very big. I guess you're right, Kit, and we'd better go easy at first," while his sister declared that she'd dream of incubators, chicken foods and hen-coops all night.

Tom was for going to Mr. Morton's office the first thing in the morning, but Kitty insisted that they should first visit the office where they were employed and secure leave of absence for the day.

"We mustn't burn our bridges behind us, even if we have been left a farm," she explained. "I'm sure Mr. Grayson will let us have the day if we show him the letter, and then we'll have a chance to look up the farm and see Mr. Morton also."

Tom laughed. "You don't even know where the farm is," he remarked; "for all we can tell it may be out West, or down South, or miles and miles away. But I don't mind asking Grayson if you think best."

Mr. Grayson gladly gave his consent and wished

them the best of luck, adding half jokingly that when they had things going well they could count on him for a customer.

They found Mr. Morton a thin, gray-haired, old gentleman, with a merry twinkle in his pale gray eyes, but he could give them very little information.

"No, my boy," he replied to Tom's queries, "I cannot divulge the character of the papers which I mentioned—in fact, I do not know their contents myself. The will merely states that the papers are to be held in trust by me until one year from the date upon which you take possession of the property, and upon that date they shall be opened and read in your presence, and that under certain conditions, which will be thus revealed, the package shall be delivered to you."

"I suppose it's some sort of a practical joke," mused Tom. "But if we can't solve the mystery, we can't. Can you tell us anything about the farm?"

"Ridgelea Farm," replied Mr. Morton, "is described as '100 acres, more or less, of tillable land, lying in the Town of Manchester, near the Windsor line and fronting for 300 feet on the Enfield road.' The land is described as divided between cleared land and woodland, and the buildings mentioned are

a frame dwelling house, a barn and outbuildings.''

''That's not very definite,'' remarked Tom. ''Where is the Enfield road and the Town of Windsor, anyway?''

''The Windsor trolley line will carry you within three miles of the property, I believe,'' answered Mr. Morton, ''and no doubt any of the residents in the vicinity will be able to direct you to Ridgelea Farm.''

''I guess we'd better have a look at it to-day, then,'' said Tom, and, thanking Mr. Morton and pocketing the papers and keys, brother and sister bade the attorney good-bye and were soon on the trolley-car.

''Walk straight down the road to the right for a mile or so and you'll strike the Enfield road,'' the conductor informed them, as they alighted far out in the country, amid the bare brown fields, leafless trees and scattered farmhouses.

''It's just cold enough to make walking a pleasure,'' remarked Kitty, as they trudged along the muddy road.

''Well, I'm glad it's no farther,'' said Tom. ''Three miles doesn't sound far, but *I* think it's pretty cold and chilly.''

''Oh, you're too easily discouraged,'' laughed his

sister. "You can't expect to have summer all the year 'round. I think this air's just splendid, and think how nice it would be to come into a cozy, cheery, big room, and sit down before a blazing open fire of real logs and drink our own sweet cider and eat our own big juicy apples."

"That's so," agreed Tom. "It will be nice to have everything of our own and feel we really have a home, won't it?"

Chatting and laughing, the two tramped along and very soon found themselves upon the broad Enfield road.

"I wonder which way we go now?" said Tom. "Let's ask at this house." Suiting his actions to his words, he entered the dooryard of a nearby farmhouse and rapped on the door.

In answer to his summons an old gray-bearded man appeared, smoking a corn-cob pipe.

"Ridgelea Farm?" he answered to Tom's question. "Down ther road ter yer left 'bout tew miles. Ye kin tell it by ther house bein' brown an' by er whoppin' big button-ball tree alongside ther road ter ther front uv it. Ain't ennybody ter hum, though. Bin shet up fer er couple er years back. Thinkin' on buyin' of it? No? Well, it's fine land; wisht mine wuz as good b'gosh."

"The place has been left to us by a relative who recently died," explained Kitty, "and we've come down to see it. Do you think we'll like it?"

"Don't say!" exclaimed the old man. "Wall, wall, I'll be glad ter hev ye as neighbors. Place is kinder run daown; needs fixin' up er bit. If Mandy was ter hum I'd trot erlong daown with ye, but I dassent leave ther place erlone. There's some pesky thing er bilin' over on ther stove now." Without waiting to say good-bye he shut the door and hurried away.

"Isn't he a queer old fellow?" laughed Tom. "Regular old hayseed, such as you see in the comic papers."

"I didn't suppose there were any farmers like that so near town," remarked Kitty, as they turned to the left, in accordance with directions. "But I'm sure he's real nice and kind. Think of him calling people 'neighbors' that live two miles away."

Along this portion of the road there were few houses and the rolling countryside was covered with bare fields and clumps of woodland. A mile away on one side stretched a range of forest-covered hills, and on the other a river glistened coldly in the autumn air, where it wound in great curves and bends through still green meadowland.

"I'll bet there's good fishing in that river and hunting in those hills," announced Tom. "When we're living here I'll spend a lot of my time tramping about."

"You'll never make a living on the farm if you do," replied Kitty. "Even a small farm requires lots of attention. But, of course," she added hastily, "you'll be able to hunt in the winter when there isn't much to be done."

"Seems to me farming's going to be all work and no play," said Tom rather sulkily. "I thought we'd be able to have a good time without working continually."

"Well, I think that work on a farm would be just the best sort of fun," declared his sister. "You'd work twice as hard, Tom, tramping all day in the woods just for the sake of killing a poor, harmless rabbit or partridge, and you'd call that sport. You know I love to have you enjoy yourself, but I never could understand why it was necessary to make some creature suffer in order to have a good time."

"I can't honestly say that I know why it is myself," admitted Tom. "I guess, after all, it's getting out in the woods that's the real fun. I always have just as good a time when I don't kill any game or catch any fish."

As he spoke they had been climbing up a sharp rise in the road, and as they reached the summit of the hill and looked ahead they saw a large, comfortable house, surrounded by shade trees, in the little valley before them.

"What a lovely place!" exclaimed Kitty. "Just see those splendid trees and those broad level fields sweeping away to the river. I'd just love to live in a place like that."

"You might as well start a hotel if you had that big house," said Tom; "but it certainly is a fine place I'll admit."

"Oh, Tom, I really believe that's our place!" cried Kitty excitedly. "It's painted brown, and there's a big tree in front of it. Do you think it's a 'button-ball'? What is a 'button-ball,' anyway?"

"I don't know," replied her brother. "But if that's Ridgelea Farm, Uncle Abner certainly did well by us. That place must be worth thousands of dollars."

They hurried down the hill and soon reached the driveway to the house.

"I guess you're right, Kit," said Tom, as they stood in the road looking at the extensive grounds, the stately maples and the fine buildings. "This big tree in front is probably the button-ball the old

farmer mentioned, and the house surely is brown. I don't see any other brown house except that tumble-down place over there," and he pointed to a small, old-fashioned house, half-hidden in neglected shrubbery and trees, a quarter of a mile farther down the road.

"Oh, I do hope so!" cried Kitty. "Let's go in and see. If there's anyone here we'll know it's the wrong place, and if not we'll try the keys and if they fit we'll know we're right."

"Hold on, Kit!" exclaimed Tom. "Here comes a farmer in a cart. Let's ask him first. We don't want to go exploring the wrong place."

At Tom's gesture the man in the cart came to a halt.

"Is this Ridgelea Farm?" asked Tom.

"Nope," replied the farmer. "Never heerd of it bein' called that. 'The Maples,' I b'leeve they call it. B'longs to some rich old codger down ter the city. Never lives here, though. 'Tain't been occerpied fer three years to my knowin'. All-fired shame ter own a place like this 'ere and not make nothin' offen it."

"Where is Ridgelea Farm, then?" demanded Tom. "A man up the road said we'd know it by the brown house and a big button-ball tree in the road

before it. This house is brown and isn't that a button-ball tree there?"

The farmer gave a loud guffaw. "Button-ball?" he cried. "Course not. That 'ere's a black walnut, an' a whoppin' big one, too. Dunno no place named Ridgelea Farm, but there's a place down the road a bit that's brown and there's a button-ball to the front of it. Reckon that's the place yer a-lookin' for." Flicking his horse with the whip he drove up the road.

"I knew it couldn't be true," declared Tom. "Uncle Ab. would never have left us such a nice place as this, even if it had been his to leave."

"Perhaps the other place is just as nice, even if it's smaller," suggested Kitty. "Let's hurry along and see it."

Very different from The Maples was the little brown house with the button-ball tree before it. It was small and squat, the veranda sagged, many of the window-panes were broken, a shutter hung by one hinge and the whole house appeared forlorn, dilapidated and neglected. Between the road and the house was a small dooryard choked with neglected, untrimmed shrubbery, dead weed-stalks and unkempt trees, while the fence which separated it from the highway was broken and the gate was stuck

halfway open. Behind the house was an ancient, weather-beaten barn, leaning drunkenly askew and stretching back to some heavy woods in the rear were fields overgrown with long-neglected, sere, brown grass.

"Oh, Tom, isn't it lonesome and forlorn!" cried Kitty.

"It's just about what I'd expect from Uncle Abner," said Tom bitterly.

"And to think how we'd planned to have a snug little home. Imagine trying to make that old place homelike."

"I suppose we might try to sell it," remarked Tom. "Bad as it is the land must be worth something. The old farmer said 'twas good land."

"Oh, dear, I can't tell how disappointed I am," declared Kitty. "After counting so much on having our own things and being so happy I never will be able to face Mr. Grayson and the girls in the office again. And we've had all this long walk for nothing."

CHAPTER II

A FRIEND IN NEED

"Don't take it to heart so, Kit," cried Tom. "After all it doesn't make any real difference. We can sell the old place and take a nice vacation with the money. Besides, we might not like farm life, anyway. Come, cheer up, Sis. It isn't worth fussing over."

He was busy trying to comfort her when they heard the hum of an automobile and turned to see a small touring car approaching.

The machine came to a stop, and the only occupant, a young man, stepped out and approached them.

"Good-afternoon," he exclaimed. "Are you not Tom and Kitty Manville?"

"Why, yes," replied Tom in surprise, "but——"

"Then let me introduce myself," interrupted the stranger. "I'm your cousin, Ralph Selwin—your Uncle Abner's stepson—and you're just the ones I'm looking for."

"We're awfully glad to know you, Cousin Ralph," declared Tom, extending his hand. "Mother used to speak of you, but she said you were always traveling in out-of-the-way places. We never expected to meet you. How on earth did you recognize us, and why were you trying to find us?"

"I'll try to explain in as few words as possible," said Selwin. "Your uncle and myself never agreed very well. He thought me impractical and disapproved of my earning a livelihood with my pen. He had the greatest contempt for what he termed 'book learning,' and especially detested my modern ideas and scientific theories on agriculture. He was reared on a farm, and believed only in hard manual work and old-fashioned methods for everything.

"Recently I returned after a long absence and found my stepfather had died and had left you this farm, which seems to have been about all he had remaining, although everyone thought him a wealthy man."

"Didn't he leave you anything?" asked Kitty.

"Not a cent, apparently," laughed Ralph. "I didn't expect anything, for he knew I wasn't dependent upon him. But he did leave me a note, in which he said that if I wanted to put my idiotic theories into practice I now had the opportunity, as

he'd left Ridgelea Farm to 'two kids,' who'd no doubt be foolish enough to let me experiment with their property. He also added that I couldn't spoil the place anyway, and that if I succeeded he'd acknowledge he was wrong—though how he expected to admit it after he was dead and gone is a puzzle to me. At any rate, that's why I'm here—to offer my services to aid in making your farm a success. I've no doubt he felt sure you'd fail and give up in despair. I went to Morton, and he told me you were out here, so I came right along. You'll let me help, won't you, and we'll turn the tables on the old gentleman yet."

"It's perfectly lovely of you to do this," declared Kitty, "but the farm looks too hopeless."

"Yes," added Tom. "Don't you think, now you see the place, that we'd better sell it for what we can get and not try to do anything with it?"

"Not a bit of it," cried Selwin. "No farm is hopeless. Why, you haven't even looked over the place yet. Perhaps it isn't really half as bad as you think. It looks run down, I admit, but that's of little importance. If the land is good and the house habitable you may find the farm all you expected. I've seen many a worse place than this rejuvenated and made into a fine property by a little hard work,

common sense and intelligent operation. Suppose we go through the house and look over the place? I may be able to help you with suggestions."

He was so cheerful and friendly and his tone was so optimistic that Tom and Kitty felt quite relieved, and decided that possibly the farm might not be hopeless after all, and together the three walked up the weed-grown path to the front door. The interior of the house smelled damp and close, but the plastering and woodwork appeared in good condition.

"I don't think the roof leaks," announced their cousin. "Of course," he continued, "some rain has driven in through the broken windows and the rooms require cleaning and repainting but it's a finely built house. Just notice the size of those timbers. They're hewn oak and will last forever almost. This place is very old, for the timbers are all pegged together, but it's still solid and with ordinary care will outlast any of the modern houses in the neighborhood. Why this old place can be made into the coziest, most comfortable little home you can imagine. Get a big blazing fire in the open fire-place in the living room, pretty curtains on the windows, carpets and rugs on the floors and you'll never recognize the place. Of course you'll need some

furniture but some of the old things here are splendid. Why that big table and sideboard are solid mahogany and some of those broken-down chairs in the lumber room could be repaired so they'd be the envy of many a millionaire. I tell you, my boy, I wouldn't trade this old homestead for half a dozen of 'The Maples' you admired so much."

He was so enthusiastic that Tom and Kitty both laughed and forgot their disappointment as he pointed out first one thing and then another and dilated upon their possibilities.

"But all that will cost a lot of money," objected Tom; "and we've only a little in the bank and if we spend our time fixing this place up we can't work and earn more."

"That's true," replied Ralph. "Now let's see how that can be managed. Possibly the farm has some resources even if it has been deserted and there are no crops on hand. Let's take a stroll over the place. If your sister's too tired she can rest here until we return."

"No indeed," declared Kitty. "I'm not tired now and I'd enjoy going over the place too."

Their first visit was to the barn and outbuildings.

"Not much here," announced Tom as they peered

into the big, dim interior. "Must leak like a sieve too. Look at those holes in the roof."

"Yes, it leaks all right," agreed his cousin, "but the timbers seem sound and the roof can be repaired and the foundation leveled up. Ah, here are some farming tools. They're a bit rusty but I guess they can be made fit for use."

The hen-coops, pigsty, cow-sheds and other buildings were in bad shape and were dismissed with a glance and the three then started on a tour of the grounds.

"The land must be good," declared Selwin, "judging by the growth of grass and weeds. The orchard needs pruning and clearing but most of the trees appear healthy and many of them are grafted. You've a good well and unless I'm mistaken there's a little brook near the edge of the woods. We'll take a stroll over there if you don't mind."

"How on earth did you know there was a brook here?" asked Tom as they stood upon a tiny bridge that spanned a sparkling little stream at the edge of the woods.

"Just by the 'lay of the land' as a farmer'd say," laughed the other. "And you're lucky too," he added. "This is a splendid trout brook and you

can have fine fishing and the best of fresh brook trout on your own property."

They had now entered an old wood road that led through a dense growth of young chestnut, oak, hickory and maple with numerous huge trees towering here and there far above their fellows.

"I have it," cried Ralph, clapping Tom on the back. "Here's your bank account. You've enough money right here to make all the changes and repairs required on the house and to keep you going until spring in addition."

"I don't see how," said Tom in a perplexed tone.

"Don't see how?" exclaimed his cousin. "Why, boy, you've over fifty acres of standing timber here, and mostly hard wood at that. The woods need cleaning up badly and you can sell the right to cut firewood and get your timber land in proper shape and secure a tidy little sum at the same time."

"You don't mean to say that anybody's going to pay me for letting them chop wood and cart it away from here," cried Tom.

"Of course," replied his cousin. "Firewood's worth $4 to $5 a cord standing and you've hundreds of cords here, which can be cut without making any impression,—just enough to thin out the growth and give the other trees room to grow. If you reserve

all the big trees and nut-bearing trees they'll bring you a good income later and the brush and trimmings will keep you in firewood all winter. When you make the sale stipulate that ten or fifteen cords are delivered to you as part of the bargain."

"Isn't that fine?" cried Kitty. "How silly we were to be so easily discouraged. But you see we didn't know anything about such matters. We'd never in the world have thought of making money from these woods."

"Of course not," agreed Ralph. "But you'll soon learn all about the resources of the farm. I'm ever so glad I arrived in time to encourage you."

"We can't thank you enough, Cousin Ralph," declared the girl. "You've made us see what can be accomplished right away and I'm sure you could transform it into a splendid place, but we're so ignorant of everything connected with farm life that I'm afraid we'll never succeed."

"It's just a pleasure to me," he replied. "I couldn't ask for anything better than thinking up ways and means of rejuvenating this old property and making it the envy of the countryside. Don't you fret about succeeding. I'll give you all the help I can and with the aid of books, your brother's

A dense growth with numerous large trees

common sense and your own good taste and cleverness we'll be able to work wonders."

It was now dusk and as nothing more could be done or seen Selwin led his two cousins to his car, bundled Kitty up in the robes and in a few moments they were speeding towards town.

As they whirled homewards the conversation was all of the farm and plans for its future.

"I'll be glad to help you find a purchaser for the wood," announced Ralph, "and if you wish I'll take you around to some wood dealers to-morrow."

"That's awfully good of you," declared Tom. "I wouldn't know where to go or how to go about it but we'll have to go to the office to-morrow."

"To-morrow's Saturday and you'll have half a day off," replied Selwin.

"Of course it's none of my affair," he added, "but my advice would be to give up your office work. You'll hardly need the money it brings in and you'll have enough to keep you fully occupied if you expect to take possession of the farm before real cold weather sets in. I'll be around at two and if everything goes as well as I expect there's no reason why you shouldn't be living at Ridgelea Farm in a week."

"Isn't he just splendid?" cried Kitty as she and

Tom entered the house after watching Ralph out of sight.

"He's a regular brick," agreed her brother.

"It seems as if we'd known him for years," she continued. "He's so friendly and enthusiastic and capable and he seems just as much interested in the farm as we are."

"I've never seen any fellow I liked better," declared Tom, "and he certainly is a hustler."

"And only think, Tom," exclaimed Kitty, "if he hadn't come along we'd have sold the farm for a song probably and would have gone on working in the office forever and now we'll be living in our own home in a week. It's like having a fairy godmother almost."

"A fairy cousin I should say," replied Tom. "But after all if Uncle Abner hadn't left us the farm Cousin Ralph wouldn't have looked us up, so uncle must be given the credit for finding us a new relative as well as remembering us in his will."

Kitty laughed. "Isn't it funny to think of willing one a cousin," she cried, "and yet that's really what happened. I wonder if Uncle Ab did it on purpose?"

"Nobody can tell, I guess," replied Tom. "Uncle Abner was always a queer old fellow and his will

seems to have been as queer as himself. First he gives us a deserted, broken-down farm and some mysterious package and then he arranges things so a cousin we've never known bobs up, and on top of it all he talks about admitting he's wrong after he's dead. It's too much for me and I give it up."

"I think we should be very grateful to him anyway," said Kitty, "and I don't see how we'll ever get along without Cousin Ralph after he goes home."

"That's so," exclaimed Tom. "I'd forgotten he wouldn't be here always. I say, Kit! I've an idea. Why not ask him to come and live at the farm with us?"

CHAPTER III

WAYS AND MEANS

The visit to the wood dealer more than fulfilled expectations and at Selwin's suggestion a representative accompanied the party to the farm to estimate the amount of available wood and to receive detailed directions as to cutting the timber.

He agreed to leave all bearing nut-trees standing and to fell only those trees which were eight inches to sixteen inches in diameter and was quite willing to deliver fifteen cords of firewood at the farm for Tom's use.

By Monday noon the contracts were signed and a good-sized sum was deposited to Tom's account in the bank as an advance payment.

Painters and carpenters were sent to the farm, Kitty busied herself selecting rugs, window curtains and household utensils, necessary furnishings were purchased and by the middle of the week the house had been completely transformed.

"If you're going to make a success of farming

you'll have to work on business lines," declared Selwin during the course of a conversation. "Keep strict accounts of expenditures and receipts and leave nothing to guesswork. Your training in office work will make this come easy and naturally and I would suggest that Kitty have charge of the books."

This excellent advice was followed and each evening Kitty went over the accounts and balances with care.

Tom spent most of his time at the farm watching the workmen, lending a helping hand here and there and clearing up the neglected garden and shrubbery while Cousin Ralph was here, there and everywhere advising, helping and instructing.

"One of the first things you'll need is a horse and wagon," he remarked on one occasion. "But until you have the barn fixed up and ready for use you can't keep it and I should advise making that your first work after moving to the farm."

"Wouldn't it be better to get an automobile?" asked Tom. "We haven't any food for the horse and we could get a second-hand car very cheap."

"A machine would be just as useful in some ways," agreed Selwin, "but during the winter you'll find a horse more satisfactory than the car and

you'll need him for plowing and farm work in the spring. An automobile is extremely valuable in farm work and later on I'd certainly advise having one. For the present, however, a horse is more essential."

With the help of the carpenters Tom had repaired the chicken-coops and had whitewashed them inside and out and had purchased a dozen hens from the old farmer at the crossroads.

The old man frequently appeared at Ridgelea while the work was progressing and Tom and he became fast friends. While the old man's ideas were far from modern he had a deal of practical common sense and made numerous suggestions which Tom found of real value.

"When ye git moved in," remarked "Grand'ther Joe," as Kitty called him, "I'll git the neighbors tergether an' lend a hand ter fix up ther barn. Don't suppose ye city folks has no idee erbout sich things. Bill Akers, over ter ther mill at ther corners, kin sell ye hay an' feed an' I'll haul it ter ye arter the barn's fixed up. Ef yer need a horse an' kerridge afore then I'll lend ye mine. Got ter be neighborly-like in ther country, ye know," and the old man chuckled good-naturedly.

"Isn't it strange how friendly all those farmers

are?" remarked Kitty to Ralph one evening as they drove home from the farm which was now nearly ready for occupancy. "Why even Mr. Grant —the man who laughed at our mistaking a black walnut for a button-ball tree—stopped to-day as he passed by and wanted to know if he couldn't do any messages for us."

"They always are a good-hearted lot, ready to lend a helping hand," replied Ralph. "It's only in the cities that men grow hard and unfeeling and care nothing about their neighbors' troubles and struggles. The longer you live on the farm the more you'll appreciate what real friendship means."

"It doesn't seem possible that only a week ago we first saw the old place," remarked Tom. "I wouldn't have believed it possible so much could be accomplished in six days."

"And to think we're really to move out there to-morrow," cried Kitty. "I can hardly believe it. And it's all due to you, Cousin Ralph."

"No, it isn't," replied Selwin, laughing. "You must thank your Uncle Abner first for leaving you the farm."

"But we'd never have thought it worth fixing up unless you'd told us and we'd have been perfectly

helpless even then without your help. I don't know how we'll ever get along after we're settled."

"O you're not going to lose me as easily as all that," Ralph assured her. "As I'm partially responsible for your venture I don't intend to desert the helm after you're launched. I expect to see you often and to have many enjoyable hours at your farm."

"That will be fine," declared Tom. "But why can't you come and live at the farm all the time? We've talked it over and we'd both love to have you."

"Why I can if you really want me," replied Ralph. "But are you sure you won't find me a nuisance and trouble? Don't forget I have a good healthy appetite, Kitty."

"If you can stand my cooking I can endure your appetite," replied Kitty, laughing. "And it will be ever so much nicer to have you here. Now won't you promise to move out to-morrow and be with us at the first meal we eat in our own home?"

"I'll be there for the meal," replied Ralph, "but I'll have to leave you for a time to straighten up a few business matters before I can make my home with you."

The next day was one of work and hustle and soon

after noon Kitty and Tom saw all their belongings safely in the farm house and while Tom bustled and hurried to get things in their places his sister busied herself in the kitchen preparing the first meal in their new home. She had a natural talent for cooking and very soon savory odors filled the huge, old-fashioned kitchen with its ceiling of dark, hewn timbers. Summoned by a knock on the kitchen door, she opened it to find Grand'ther Joe's wife Mandy with a great covered basket on her arm.

"Land sakes!" cried the apple-faced little woman, sniffing the air. "If it don't smell real homey and comfy already. Well, well, I never 'spected to live ter see the old place occerpied by folks ag'in. An' to think yer a-cookin' already. Land sakes! I didn't s'pose city folks ever cooked nothin' an' I says to Joe says I, 'Father, I'm a goin' ter take some vittals over ter them young folks. I know they won't hev time ter cook nor nothin',—even s'posin' she knows how—which most likely she don't —an' they must be hungry as bears, what with movin' in an' gittin' settled and all, an' so I come right erlong over and fetched erlong a few vittals fer ye."

"O that's lovely of you," cried Kitty. "I just know you've been to a lot of trouble and I can't

thank you enough. Cousin Ralph is coming to dinner. You see it's our first meal here and we're going to celebrate and that's why I'm trying to cook some real nice things; but I know yours will be ever so much better. Can't you and Grand'ther come over too?"

"Shucks, no," exclaimed Mandy. "I've got to run erlong home and look arter the milk and cream and sit out father's supper. We're a gittin' too old fer sech jinks an' like ter set ter hum and git to bed early."

As she spoke she was lifting the various articles from her basket and placing them on the table and Kitty uttered little cries of admiration and surprise as she saw the golden-brown pumpkin pies, the jars of preserves, the pats of home-made butter, the doughnuts and the rosy apples that Mandy placed before her. Finally the last article was brought forth and as the napkin which covered it was removed a plump, roasted chicken was revealed.

"You dear Aunt Mandy," cried Kitty. "I do believe you suspected Cousin Ralph was coming all the time. Why you've brought enough to feed Tom and myself for ages." Flinging her arms about the little old lady she kissed her affectionately on both cheeks.

At this moment Tom rushed into the room. "O Kit," he cried, "what do you think, the hens have laid three eggs." Then, catching sight of the array of good things on the table, he stopped short in amazement. "Where in the world——" he began and then, noticing Aunt Mandy, exclaimed: "O, that's where they came from! I say, isn't this bully? Where's Grand'ther Joe? Aren't you two coming over to help eat all this feast?"

"Laws, just hear the boy," cried Aunt Mandy. "Why I ain't brought nothin' but a few vittles, jest thought ye'd be hungry-like an' 'twould save ye the trouble of cookin'. I got ter be trottin' along now."

So saying she popped out of the door.

"Isn't she a dear old soul?" exclaimed Kitty.

"Yes, but look, Kit, our hens have laid eggs," persisted Tom. "See here, three of them." He proudly placed the eggs on the table beside Aunt Mandy's offerings.

"Then we really will have something from our own farm," cried his sister. "And on the first day we've lived here. I know Cousin Ralph will think that's splendid; but hurry up, Tom, and get things in order. I'm not half ready for him yet and he's liable to come any minute."

By the time Ralph arrived everything was ready and the three sat down to a meal which marked an epoch in their lives.

"It certainly looks like a good omen to have your hens lay the first day you arrive," he said after Tom had told him of the event. "But if you expect to make anything from your hens you must attend to them systematically, feed them and rear them scientifically and see to every detail in connection with them with the greatest care. Poultry is profitable if properly raised and bred, but if you are to succeed with it you must follow up-to-date, scientific methods. I can give you a few pointers and you can secure more information from various books and from the pamphlets published by the United States Department of Agriculture which are distributed gratis."

"Why I didn't know the government bothered about hens and such things," exclaimed Tom.

"A great many real farmers are ignorant of the fact," replied Ralph, "and it's a great pity, for the government publications are concise, exhaustive and absolutely reliable. They cover every possible phase of farm work and you can't do better than always to use them as your guides. I brought a few of the pamphlets with me to-night and I'll bring

more when I move over, as I have practically all that have been issued. You'll notice, when reading the pamphlets on poultry, that various breeds are mentioned and this is a most important matter."

"I know some breeds," remarked Tom. "Fred Barton had some he called Plymouth Rocks and some others he called Wyandottes but *I* never could see much difference between them."

"Plymouth Rocks and Wyandottes are both so-called 'general purpose' breeds," said Ralph. "Orpingtons, Rhode Island Reds and several other breeds also belong in this class. For a small poultry farm or for home use they are all excellent as they lay well, are hardy and easily raised and are good table birds. Moreover they are good mothers and where eggs are to be hatched under hens and incubators are not used this is an important consideration. On the other hand, if eggs are the principal object such breeds as Leghorns, Spanish, Minorcas, etc., should be kept. These stand first as layers but they're small and inferior table fowl and seldom sit, and hens of some other breed should be used as mothers. Moreover, they are rather tender and susceptible to cold weather."

"I guess I'll stick to the Plymouth Rocks then," remarked Tom.

"A better plan is to have several breeds—each for one purpose," replied Ralph. "Thus you can have a few Plymouth Rocks, some Leghorns and some Cochins or Bramas, and if they are kept in separate houses and runs the breeds will remain pure and you'll have fowls for every purpose."

"What are the Cochins and Bramas?" asked Tom.

"They're large, heavy breeds, excellent for eating and often good layers," explained his cousin. "For the present, however, you'll scarcely require Plymouth Rocks or other general-purpose breeds, as the hens you have, although not pure-blooded, are principally Plymouth Rock stock and will serve your purpose just as well as more expensive fowls."

"I can't exactly understand how there's any profit in buying fowls and feeding them and then killing them to sell again," said Tom in a puzzled tone. "If I have to pay the market price for the chickens in the first place how do I make anything?"

Ralph laughed. "Your business wouldn't prove profitable under such conditions," he replied. "The point is to buy young pullets at a low price, raise them to marketable size and sell at a profit, or else buy eggs and raise the chicks. After a little time you'll be in a position to set eggs from your own

hens and raise your own stock but for a start you'll have to purchase the birds."

"I don't believe any of the farmers around here have any of those breeds," said Tom. "How will I be able to buy them?"

"There are many dealers in pure-bred poultry in the vicinity," answered Ralph, "and their addresses may readily be found by looking over one of the monthly magazines devoted to poultry or the farm."

"You really don't mean that there are magazines just for farmers?" cried Tom.

"Certainly there are. And mighty fine ones, too," declared Ralph. "I'd strongly advise you to subscribe to one—look over a number and select the one you like best. They're full of useful information, valuable facts and advertisements. Kitty'll find them fully as interesting as yourself for they have departments devoted to home decoration, cooking, needlework and flower culture. And speaking of flowers, Kitty, if you're fond of them you can easily raise them indoors this winter and may be able to add something to your income."

"Oh, I just love growing plants," cried Kitty. "Do tell me what I can raise and how I can start,

Cousin Ralph. Do you really think I can make money from flowers?''

''Of course you can,'' replied her cousin. ''Although it's too late to start some things, yet there are numerous varieties which are easy to grow and which sell well. The only trouble will be to secure customers. If Tom will take a day or two off and will visit the leading caterers, undertakers and restaurants he can probably secure orders for all the flowers you can furnish at reasonable prices. Then there are private houses where flowers are used a great deal. Watch the announcements of weddings, balls, dances and entertainments and make estimates for the flowers used and I've no doubt you'll be able to sell everything you can raise. I think you'll find little spare time on your hands, however, between cooking, housework, keeping the books, etc. There's always something to be done on a farm, you know.''

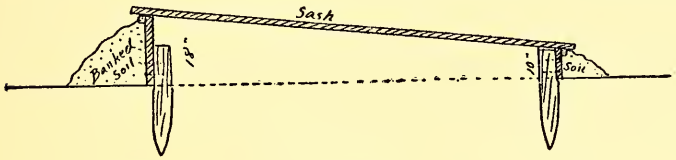
''I shan't mind how busy I am,'' declared Kitty. ''I'll just remember Uncle Ab's statement that hard work never hurts anybody. At any rate I am sure I won't find it half as bad as sitting at a typewriter all day.''

''I've no doubt it will be pleasanter and healthier,'' agreed Ralph, ''but you'll certainly require

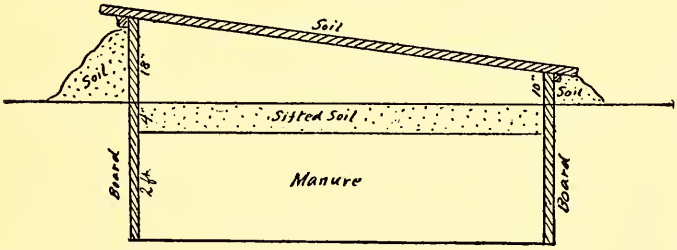
help about the place before spring. During the winter there'll not be so much to attend to and aside from caring for the poultry and the horse—when you have one—almost anything can be put off until you have time to attend to it."

"But you haven't told me how to grow the plants yet, Cousin Ralph," persisted Kitty.

"Well, if you'll promise me you'll not overwork



Cold-frame



Hot-bed

and will get a woman to help about the house I'll tell you what I can about floriculture indoors and you can take it down in shorthand. In the first place you'll require several hot-beds and one or two cold-frames and some seed-boxes. Hot beds are easily made by digging a hole the size of the bed, and

boarding it up with planks with the sides projecting above the earth for about ten inches on one end and eighteen inches on the other. It will make it clearer if I draw a sketch. There, this will give you the idea. The hole should then be filled with manure, prepared by adding some fresh stable manure to old manure, straw, litter and leaves and leaving it until the heat generated decreases to about 100 degrees Fahr. The manure should then be placed in the hole of the frame and well pounded down until within six to ten inches of the surface of the surrounding earth. It should then be covered with a layer of fine, sifted, rich soil three or four inches deep. Over the top of the frame sashes should be placed—you can buy old sashes very cheaply from house-wreckers—and the sash should be left in place for three or four days. The manure mass within will become very hot and will destroy the life of any weed seeds that may be in it. A thermometer should be placed in the bed each day and when the temperature falls to 95 degrees the bed is ready for planting. It should then be banked up outside with coarse manure, soil, straw or litter as I've indicated in the sketch. Cold-frames are still easier to make. The sides are merely old planks or boards and the tops are old window-sashes. Se-

lect a dry, well-drained spot with a southern exposure and set four stout posts in the ground and nail the sides to these. Let the boards set into the earth a few inches and have the earth within the frames well spaded and manured. You should also have some old burlap or board covers to place over the sash. A frame six by twelve feet will be amply large enough for your purpose and if the sides are one foot high at the rear and nine inches at the front it will be about right. Seed-boxes are just shallow trays or boxes twelve to eighteen inches square with holes for drainage in the bottom. Cover the holes with bits of broken flower pots or pebbles and fill the boxes with soil composed of a mixture of one-third leaf-mold—the dark surface earth from the woods—one third sharp, clean sand—which you can obtain from the bed of your brook—and one-third good field loam.

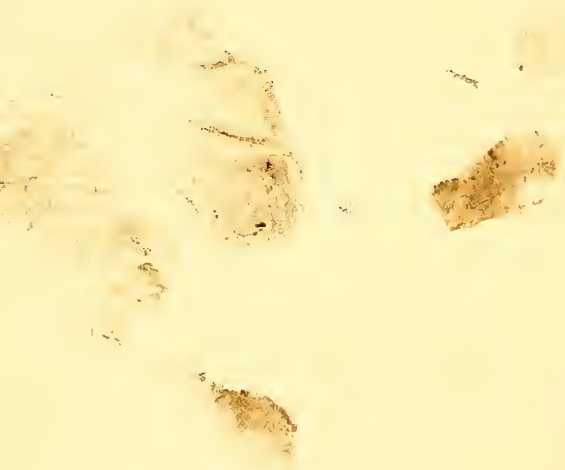
"It is too late for you to raise some things, as I told you, but violets, carnations, sweet alyssum, mignonette, hyacinths, coleus and various bulbs may all be grown easily. I'd advise starting the violets first. It's too late to grow them from seed but you can purchase one hundred runner plants of the best English varieties for a few cents each and set these in a cold-frame, leaving the top open to the sun and

air during the day until the weather becomes quite cold. By December the plants should be well grown and covered with buds and you should have a constant succession of violets all through the winter. During really cold weather keep the sash of the frames covered with old matting, carpets or burlap and raise the sash to admit air and sunshine on every warm, pleasant day.

"As soon as the violets are started plant bulbs of narcissus, freesia, hyacinths, etc., and set them in the cool, dark, lumber room to start. The seed-boxes may be planted with sweet alyssum, mignonette, heliotrope, etc. In some of the boxes plant cuttings of begonias, coleus and carnations. If you buy one or two plants you can readily obtain enough cuttings to fill your boxes. By keeping the bulbs cool and dark or by placing them in warm, sunny situations you can produce flowers at almost any time, but remember that with all flowering plants the great secret is to water freely while the plant is growing or producing flowers and withhold water as much as possible while the plant is resting or dormant. You will have to keep your growing plants and seedlings in a sunny window where there is an even temperature—that big corner window in the dining room is just the place—and avoid dust.

Sprinkle the leaves and wash them with soap and water if you are troubled with insects. The violets and flowering bulbs will sell well as cut-flowers, the young carnations, well-started bulbs and coleus will sell as potted plants, and the alyssum, mignonette, coleus, heliotrope and carnations may all be used for filling window boxes to order. Tom can easily make very attractive and pretty boxes with natural bark from the woodpile and in addition you can no doubt secure contracts to fill boxes which many people already own. They often pay five or six dollars to have a florist fill a box and the stock costs but a few cents. You will no doubt have to buy a few things such as trailing vincas, geraniums and small palms from the florist to fill out the boxes; but even counting on these the entire cost of the plants in a five-dollar box should not be over one or two dollars. In the spring you can start in planting carnation, gloxinia, coleus, cyclamen and other rare flower seeds in the hot-beds and by next autumn you will have quite a stock of plants for your winter's sales. By that time you may require a small greenhouse or conservatory which Tom can easily build for you. The hot-beds will also be useful in starting various vegetables and the cold frames can also be used in connection with the kitchen garden; but that will all

come later. I've given you a long lecture and I must be running along. Gracious, it's nearly midnight now. Well, good night, I'll expect to find you both full-fledged farmers when I see you in ten days or so." And Cousin Ralph hurried down the path while Tom and Kitty stood in the old-fashioned doorway and watched the tail-light of his car until it disappeared around a distant bend of the road.



CHAPTER IV

HELPING HANDS

"The first thing I'm going to do," announced Tom the next morning, "is to go to town. Before I can get my hens I've to build more houses and runs and before I can do that I've to buy some tools. I've made up my mind to be my own carpenter hereafter. I've been watching those men at work here and I've picked up a lot about using tools and I think chicken houses will be good things to practice on."

"Poor chickens," laughed Kitty teasingly and added: "Of course you can do all the carpenter work about the place, Tom. I'll go along to town with you and while you're buying tools and such things I'll try and get some promises of flower orders."

Tom looked thoughtful and after a moment exclaimed: "I don't like that idea, Kit. I hate to think of you going about asking people to buy things. Somehow it seems like begging to me."

"Why, what perfect nonsense!" cried Kitty.

"It's just a matter of business and I don't mind it a bit. It isn't half as bad as running around collecting bills and rents the way you had to do for Mr. Grayson. Tom, I do believe I'll go to him first of all. He said we could count on him as a customer and I'm going to make him keep his word. Mrs. Grayson is always giving dances and teas and entertainments."

"But you haven't any flowers to sell yet," remonstrated Tom. "What's the use of getting orders for what you can't furnish?"

"Well, what's the use of planting things unless you can sell them?" demanded his sister. "I'm going to find out how many I can sell and then I can tell how many to plant. Isn't that good business?"

"Yes, I suppose 'tis," admitted Tom, and added: "We might as well try and get those old window-sashes for the hot-beds and cold-frames today and save another trip."

"Yes, and then we'll work hard and get things started and won't have to come in town again until we're ready to buy the plants and chickens," cried Kitty. "Now hurry up, Tom, and feed the hens while I straighten up the house and we'll get started right away. Are you going to have the things sent out?"

"No, I'm going to take Grand'ther Joe at his word and borrow his horse and wagon," replied Tom. "Then we can drive into town and bring out a load of stuff ourselves. We'll have to do everything for ourselves from now on, you know." Presently Tom returned from the poultry yard and proudly presented four fresh eggs to Kitty.

"I'm going to keep account of all these eggs," she announced. "If the hens didn't lay them we'd have to buy from other farmers, and with eggs selling at 50 cents a dozen they'll make quite an item."

"Wait till I get some real egg-breeds," said Tom. "Then you'll see what hens can do to pay for themselves. I read that pamphlet on hens after I went to bed last night and it says some breeds lay as many as 200 eggs a year on an average. I'm going to get 30 hens and that will give me 6,000 eggs a year. Just think of it, Kit, twenty eggs a day! If I save half of them and hatch them out I'll have 3,000 chickens at the end of a year and if half of them lay I'll get 300,000 eggs the next year, and——"

Kitty burst out laughing. "O Tom," she cried. "Don't go on any further. At that rate you wouldn't have room on the whole farm for the

chickens. At the end of two years you'd have about 30,000,000 fowls overrunning the place."

"Well, you don't for a moment think I'm such a fool as to expect that, do you?" demanded Tom in an injured tone. "I'm simply telling what would happen if none of the chickens died off or were killed and all the eggs hatched and all the hens laid as many eggs as they should. I just intended it to illustrate how rapidly chickens increased. But anyhow we're going to make money off poultry. See if we don't."

"I haven't the least doubt of it," replied Kitty. "I've always wondered why eggs cost so much and after hearing Cousin Ralph talking to you last night I think I understand. The trouble is our farmers don't raise poultry scientifically. You know what Ralph said about pure breeds. Well, these farmers never have pure breeds and yet they expect good results. Why, nobody would expect to make any success with mongrel dogs or other animals, would they? And yet they all keep mongrel hens. I can see that myself and I've only lived on a farm for a little more than one day."

"That's because you've got brains," declared Tom. "The books say just about the same things and that our farmers have gone on in the same old-

fashioned way of doing things and haven't kept up with the times or modern methods and that's why they fail to make their farms pay. I'm going to run our farm on the latest and most scientific lines and prove to these farmers around us that city folks can beat them at their own game."

"I feel sure we can do it, too, Tom," cried Kitty. "With Cousin Ralph's help we're sure to succeed. But come along. If we're to do all those errands in town we must be hurrying."

The two found Grand'ther Joe hard at work chopping wood and he looked up and welcomed them with a cheery "Howdy, glad ter see ye erbout. Slep' well las' night, did yer? Didn't know but ye'd find it kinder strange and lonesomelike arter livin' in the city."

"May we borrow your horse and wagon for the day?" asked Tom.

" 'Course ye kin," replied the old man, "an' welcome ye be to 'em. Ain't goin' nowheres terday an' Mandy's a-bakin'. I'll hitch up right smart fer ye. Won't ye come in an have a bite ter eat?"

"No, thanks," answered Kitty. "But I'll run in and say good morning to Aunt Mandy while you and Tom are getting the horse harnessed."

Ignorant as was Tom about many items of farm

life yet he *did* know how to harness a horse. He had always been fond of horses and during his visit to Fred Barton's home had spent a large portion of his time caring for the horses, harnessing them and driving them about. He had even learned to plow and to drive a mowing-machine and felt perfectly at home wherever horses were used.

"Don't bother, Grand'ther," he remarked. "I'll hitch up the horse if you don't mind and save you the trouble."

"Wall, wall," exclaimed the old farmer. "Ye don't mean ter tell as how ye can hitch up er hoss?"

"Surely," laughed Tom. "You mustn't think we city folks don't know anything." And stepping to the barn he was soon busily currying and brushing the old sorrel mare and in a few moments drove out from the wagon-shed and drew up before the farmhouse door.

"Wall, I swan!" cried Grand'ther Joe as he saw him. "Ye suttinly did git ol' Nell hitched up purty lively I must say. Curried her too b'gosh! Reckon ye know more erbout critters than I thought ye did."

Kitty now appeared, and, with farewells from Mandy and her husband, brother and sister rattled off towards town.

Grand'ther Joe looked up and welcomed them

Near Grayson's office they separated, Kitty to interview her former employer while Tom drove off to find a "house-wrecker," as Ralph had expressed it, and a hardware store. At the latter he purchased the necessary tools, depending upon the judgment and advice of the dealer and frankly admitting that he knew little about using tools and wanted those that would serve him best.

"You don't require many tools," said the salesman. "A cross-cut and rip-saw, three planes, a square and level, a draw-knife, a couple of chisels, a hatchet and hammer, bit-stock and augers, a screwdriver and a supply of nails and screws will be about all."

"That sounds like a lot to me," exclaimed Tom, "but if you say they're necessary let me have them."

"Very well, sir," replied the clerk. "Let me advise you to buy the best. They'll cost a little more in the first place but they'll be cheapest in the end. Poor tools are a nuisance and you'll get far more satisfaction from proper tools and will be able to do better work."

"All right," agreed Tom. "Give me the best," and then, as an idea occurred to him, he added: "Do you know where I'll find a house-wrecker?"

I want some old window-sash for making cold-frames and hot-beds."

"There are several house-wreckers in town," replied the salesman as he wrapped up the tools, "but I can tell you where you'll be able to get sash to better advantage. There's a dealer in sash and blinds down on Spruce Street and you'll find anything you want there. Sash with small lights of glass are going out of style and you can buy them very cheaply. For your use I presume the size of the panes does not matter."

"Not at all," said Tom. "But I should never have thought of it if you hadn't mentioned it. I'm ever so much obliged for the information."

He had no trouble in finding the dealer in sash and blinds and secured a number of suitable window-sash for a very low price. With the sash, three rolls of poultry-netting, his tools and hardware the wagon had quite a load, and having procured all he required Tom drove to the spot at which he was to meet Kitty.

She soon arrived and was enthusiastic over the success of her day's work.

"Mr. Grayson was just lovely," she exclaimed as they sat together in a nearby restaurant. "He telephoned right out to his wife and she agreed to send

me a list of the dates of her entertainments and to order all the flowers we could supply from us. She also promised to speak to several of her friends about it and Mr. Grayson promised me the contract of filling all their flower-boxes in the spring. They have a lot of them around their piazzas, you know. Mr. Grayson thought we were doing splendidly and said to let him know just as soon as we had eggs and things to sell. He wanted to know if we could send him a load of wood for his open fireplace. He wants selected hickory and birch and is willing to pay a fancy price."

"What did you tell him?" enquired Tom.

"I said we could furnish it, of course. If we can't get enough out of the fifteen cords the Walton Company give us we can cut some especially for him, you know."

"Well, you certainly seem to be a good business manager," declared Tom. "If we can furnish the goods I guess there won't be any trouble about selling them."

A stop was made at a news-dealer's, where Tom purchased several farm and poultry magazines and long before sunset everything was safely delivered at the farm and the horse and wagon were returned to their owner.

" 'Spect ye'll be wantin' ter use ther barn purty quick," commented old Joe as Tom was leaving. "Mought as well git ther neighbors tergether an' help ye fix it up Saturday next, if thet'll suit ye. I'm a gittin' too old fer to do any shinglin' but I'll he'p with shorin' of it up and Nick Wood and his brother'll patch ther roof an' Frank Carter'll fetch along his stoneboat an' Jim Grant'll sell ye a load er hay and Bill Akers kin haul over a load er straw an' Mandy and the wimmen-folks'll bring erlong the vittles and we'll hev a reg'lar ol' time barn dance in ther evenin'. Land Sakes! we hain't had er barn raisin' fer so long I 'most fergit."

"Oh, we couldn't expect you all to give your time to help us in that way," remonstrated Tom. "I'll be glad to pay for any labor we need and we'd be ever so glad to have you all come over and have a good time and a barn-dance, as you call it, but you really mustn't do so much for us."

"Now looker here," exclaimed old Joe severely. "I dunno what yere a-talkin' on when ye speak o' payin'. O' course city folks don't know erbout sech things or I'd be reel put out by ye. Ye see a barn raisin's a reg'lar celebratin' in ther country-parts an' while thet barn o' yours ain't a new barn to be raised it's purty nigh the same thing an' we'll jist

pertend it's a reg'lar ol'-fashioned raisin' and hev a good time an' all the fixin's accordin'. Now don't ye fergit Saturday's ther time an' we'll all be on hand sure." With this parting injunction he bade Tom good-night.

Kitty was highly amused over Tom's account of the coming barn dance and celebration and declared it would be a great treat. "I suppose it's like a house warming," she remarked. "And the neighbors all come to get acquainted and make you feel at home among them. But isn't it funny to have it in the barn?"

"I guess there's no room in the houses," suggested Tom. "The barns always seem to be the biggest things on the farms."

The next few days were busy ones at the farm. Tom worked diligently at his chicken houses and while at first he had some difficulty in sawing the boards straight and in using his materials and tools to the best advantage he managed to put up some very creditable houses for his prospective poultry. He then turned his attention to the hot-beds and cold-frames and by Friday afternoon saw them completed.

Saturday dawned clear and pleasant and before Tom and Kitty were through breakfast Grand'ther

Joe and several of the neighbors arrived. They lost no time in commencing work on the barn and Tom was more than surprised at the rapidity with which the repairs proceeded. High on the roof the Wood brothers labored at shingling; Frank Carter's stone-boat moved continually back and forth carrying stones for repairing the foundation walls, and old Joe, pipe in teeth, directed and helped Tom and a couple of husky young farmers as they lifted the frame of the great building by jack-screws and 'shored it' up true and level. By noon the shinglers had completed their work and after lunch began ripping up the rotten and broken floorboards and laying new ones and by the time Aunt Mandy and the other "wimmen folks" drove up with the good things for the feast the barn was once more erect and presentable with a tight roof above which stood a green cedar tree—emblem of a barn-raising—while hay and straw piled high in the racks lent a fresh, sweet odor to the big interior.

It was a jolly party that gathered in the barn and by the light of lanterns danced, sung and laughed far into the night while Grand'ther Joe, perched upon the oat-bin, sawed industriously at his battered fiddle and the merry-makers helped themselves to

Tom had learned to drive a mowing machine

The barn was 'shored up' and reshingled

toothsome "vittles" heaped in profusion on an extemporized table.

Both Tom and Kitty were glad of Sunday for a day of rest and on Monday they again visited the city; one to purchase a supply of seeds, plants and bulbs; the other to secure blooded poultry as the nucleus of the flock.

"I don't see why we shouldn't buy our horse now," remarked Tom as they drove towards the town. "The barn is all ready, the hay and straw are there and we'll need a horse and wagon more and more from now on. I believe I'll look around and try to find a horse and wagon to-day."

Kitty agreed that there was no time like the present and early in the afternoon Tom drove proudly back to the farm in his own wagon while old Nell jogged contentedly behind with her halter hitched to the tail board.

"Purty good-lookin' hoss ye've got," remarked Gran'ther Joe as he met them at his gate. "Kinder puts the old mare in the shade. An' chickens! I swan! What *be* yer goin' ter do with all them fancy hens?"

"Get eggs," laughed Tom. "These white leghorns ought to average 200 eggs a year and these Cochins will furnish roasting chickens that weigh

more in six months than most old hens in a year."

"Wall, ye won't make nothin' offen chickens in winter time," declared the old man. "Hens allus stops layin' when eggs go up."

"Rather, eggs go up when hens stop laying," commented Tom. "The reason is that most people hatch all their chicks about the same time. If you hatch some every month you'll have a succession of layers throughout the year. That's what the government's books say and they ought to know."

"Wall, I wish yer luck. Book larnin's a great thing an' we l'arn suttin new ev'ry day. 'Spect ye'll be a showin' on us a heap o' new idees about farmin'," said the old farmer with a touch of sarcasm.

It was a proud moment for Tom when he saw his new poultry yards occupied by the flock of scratching, clucking hens, and the horse in its stall munching at the hay and oats, and when he and Kitty were aroused by the crowing of their own roosters and Tom stepped forth into the chill morning air to attend to the wants of his live-stock he felt like a true farmer at last.

For several days the ring of axes on timber had been borne faintly across the fields from the woodlot and after breakfast Tom announced that he was going to the woods to see how the choppers were

getting on. "Cousin Ralph said to keep an eye on everything," he remarked, "and anyway I'd like to see the men at work. I'll have to learn to cut trees myself and I might as well begin now."

He was amazed at the change which had been already wrought in the woods and in the place of the dense growth found an open grove of chestnut and walnut with a few small saplings while great piles of cordwood stood here and there and freshly-cut chips gleamed white among the fallen leaves. The cutters had penetrated some distance into the woods but Tom noticed that they had adhered to their agreement and had spared nut trees, small saplings and timber trees, and he was surprised at the number of trees which had been cut without leaving the land bare and naked. In fact the place was greatly improved and the big chestnuts and walnuts showed to far better advantage than when he had first seen them surrounded and hidden by the close-growing younger trees.

The choppers were swarthy French Canadians and Tom gazed fascinated at the rhythmic swing of the gleaming axes and the manner in which they bit deep and true into the wood. Almost in no time, as it seemed to Tom, the trees were severed and fell crashing to the earth and he envied the woods-

men their skill and longed to be able to swing an axe and cut trees himself.

"Does it take long to learn to chop like that?" he asked of the big-boned foreman.

"That depends, mister," answered the other. "Some folks never learn and t'others just take to it natural-like. These 'ere Kanucks was born and brought up in lumber-camps, as you might say, an' swingin' an' axe is as easy as walkin' to 'em." As he spoke he stepped forward and with one or two deft strokes severed a stout limb that had caught on a nearby tree as it fell.

"Well, it looks easy enough," remarked Tom. "How many cords have you cut already?"

"Forty odd," replied the foreman, "not counting odds and ends. By the way," he added, "how about them rock-maples up yonder. The boss didn't say nothin' about leavin' 'em but it seems a pity to cut down good sugar-trees for firewood."

"What do you mean by sugar trees?" asked Tom, puzzled.

The other stared at him in amazement for a moment and exclaimed: "Don't you know what a sugar-tree is? Why a tree what you get sugar from —a sugar-maple or a rock-maple. You've a good

grove of 'em yonder and you oughter get fifty pound o' sugar at the least."

"O, you mean maple sugar," said Tom. "Of course I know what that is, but I never really stopped to think that we might get it from trees here."

"Well, if I was you I'd see the boss about it. Of course a contrac's a contrac' but I reckon the boss won't insist on them maples. He'll get more than what he bargained for without 'em."

"Thank you for telling me," said Tom. "I didn't even know they were there and I'll see about them to-day. I suppose you can let them stand until the last anyway."

"Sure," agreed the foreman. "No hurry at all and say, have you got any choice about them fifteen cord of wood we're to deliver to you? Of course it's all mixed stuff but some of it runs pretty much all birch and hickory and other lots run mostly chestnut and oak. Thought you might have a choice about it."

"I guess I'd prefer the birch and hickory," Tom replied, thinking of Mr. Grayson's order.

"That's all the better for us, then," laughed the big lumberman. "The birch is mostly near the edge o' the timber and a shorter haul to your place."

"They're getting on finely," Tom announced to Kitty as he entered the kitchen where she was kneading a great mass of dough. "They've cut forty cords already and the foreman is going to give us wood that's mostly all birch and hickory so we can fill Mr. Grayson's order all right. And just think, Kit, there's a lot of maple trees there that the man says will give us at least fifty pounds of maple sugar—real maple sugar. I'm going in to see the Walton Company and arrange to have the maples spared."

"Hadn't you better wait until Cousin Ralph comes back?" questioned Kitty.

"No, I'm sure I can manage it alone. I'm finding that there's nothing like farming to teach self-reliance and besides I want an axe. I'm going to learn to chop wood myself. Is there anything you want in town?"

Tom had no difficulty in persuading Mr. Walton to leave the maples.

"I wouldn't *think* of sacrificing them," declared the wood-dealer. "Although I'm in the business I realize the necessity of conserving timber and I have no sympathy with those who cut everything clean and destroy fine and valuable timber trees or such trees as your maples for the sake of

firewood. I'm glad that you have realized the necessity of protecting your timber lands so soon, Mr. Manville."

"O, I shouldn't have known enough to do so," confessed Tom, laughing. "Cousin Ralph advised me."

"You'll never regret his foresight," Mr. Walton assured Tom as he rose to leave. "But I would suggest that you have the brush and trimmings cleared out as soon as possible. They will prove a menace later on for they are the best of fuel for forest fires and fire is the greatest danger to timber lands. As long as your woods are free from brush and branches you'll have little to fear—dead leaves alone will hardly provide enough material for a fire that will seriously injure the large trees, although if the timber were mine I should keep the earth free from an accumulation of leaves also."

"That sounds like good advice," replied Tom, "and I'll certainly follow it. I'm very much obliged to you, Mr. Walton."

As soon as Tom reached the farm and had stabled the horse he essayed to test his ability as an axeman. His first attempts were on some old boards which he found very easy to split and cut, and, pleased

with his success, he searched about for something more worthy of his efforts.

At first he could discover nothing but finally, in a corner of the woodshed, he found a number of six-inch logs which seemed just the thing.

Much to his chagrin the edge of his axe made scarcely any impression on the wood despite his utmost efforts. Feeling that only practice would make perfect he assaulted the log with redoubled vigor and for an hour hacked away until when Kitty called him to lunch he realized that his labor had been wasted and that a little irregular notch was all he had to show for his tired back and blistered hands.

"I guess I wasn't cut out for a wood-chopper," he confided to Kitty. "I can't understand how those men can work at it all day long and make so much headway. I'm as tired as a dog and I haven't even cut through one log yet."

CHAPTER V

MAKING WORK INTO PLAY

"Things certainly have been progressing," declared Ralph as Tom and Kitty led him proudly towards the barn upon his arrival after a two weeks' absence.

"Why the old barn looks as good as new. So you've bought your horse and wagon and have put in your stock of hay and feed," he exclaimed as they entered the barn. "Good for you, Tom, I'm glad to see you didn't wait but went right ahead on your own initiative."

He was greatly interested in their account of the "barn-raising" and dance and then turned to examine Tom's poultry yards.

"Fine," he announced. "You've selected good hens and your houses are a credit to your skill as a carpenter, Tom. I notice you've adopted the apartment-house plan with a single large yard divided by netting into several runs."

"Yes, I decided that would cost less and would

be easier to build," replied Tom. "In the spring I intend to start several colony-houses, but after going over the pamphlets carefully I came to the conclusion that the apartment-house was preferable during the winter."

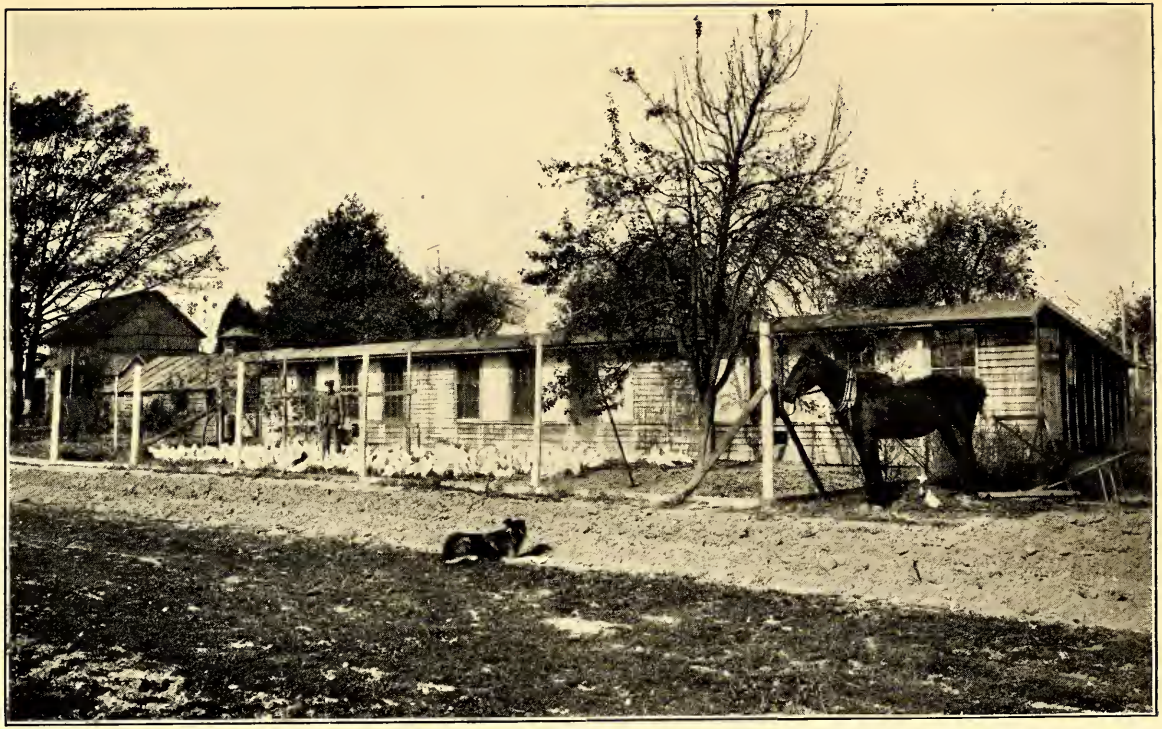
"I quite agree with you," said Ralph. "You'll find them much easier to look after. How are the hens getting on?"

"Well, they're not giving many eggs, I must admit," replied Tom. "Yesterday we found ten eggs from the leghorns and four from the mixed hens, but the Cochins haven't laid any yet. We're just beginning to save up what we don't need ourselves. Kitty thought she'd be able to sell some this week."

"That's not as many as you should get," agreed his cousin. "How are you feeding them?"

"I'm giving them a mixture of whole grain and mash three times a day," replied Tom.

"They need animal food, I suspect," announced Ralph, "and probably lack green food as well. Cut a quantity of your clover-hay into short lengths and soak it in water over night—pouring the water over the hay boiling hot—and mix this with the mash. Buy a few bushels of turnips, some pumpkins and similar vegetables and feed these after cutting them into large pieces. Each time you go to town bring



The poultry houses were a credit to Tom's skill

back some green bones and scraps of meat from the butcher-shops and feed these and the table-scraps freely, and I guess you'll find the eggs rapidly increase in number. With your 16 leghorns, you should get fully ten eggs daily and the Cochins and mixed breeds ought to lay ten more."

"I think you're giving too much time to Tom and neglecting my things," laughed Kitty. "Come and see what you think of my hot-beds and cold-frames."

"Your violets are doing finely," declared Ralph after examining the healthy young plants in the cold-frames. "You should have a good supply of blooms all winter. And your seeds seem to be sprouting well and your bulbs are coming on nicely."

"How are the cutters getting on in the woods?" he asked presently. "I can hear the sound of their axes."

"They've cut about fifty cords," replied Tom. "And do you know, Ralph, we've a grove of sugar-maples there."

"I hope you didn't let them go," exclaimed Selwin.

"No, the foreman told me of them and I went to see Mr. Walton about the matter. He was very

willing to let the maples stand. He advised me to have all the brush cleared out to prevent fires and also suggested getting rid of the dead leaves. He's strong on preserving timber lands."

"That's good advice," said Ralph. "You'll find a quantity of good firewood in the brush and the finest portions scattered in your poultry runs will afford exercise for the hens in scratching, while other portions of the brush should be saved for your peas and for bean poles in the spring. It will be a good plan to start clearing out the leaves just as soon as possible. They'll make the best of humus and fertilizer for your land if left on the ground over winter and plowed into the earth in the spring. It would be still better to turn them under this fall but you'll hardly have time for that now."

"It seems like an awful undertaking to have to gather up all those leaves," remarked Tom. "There's such an endless lot of them."

"Don't think about it. Just start right in with a will and you'll be surprised to find how rapidly you progress," advised Ralph. "You can make a large leaf rake," he continued, "by driving wooden pegs into a piece of wood attached to a handle and by loading the leaves into bags and packing them down you can carry a great quantity

at a time in the wagon. You'll find there are not so many as you think after all, and every load you haul you can count as money in your pocket for the leaves and decaying vegetation and leaf-mold among them will save many dollars' worth of fertilizer."

"I'll start on that first thing then," declared Tom, "and I hope I'll make a better success of it than I did at chopping wood." Laughingly he related his attempts on the logs.

"That's rather strange," remarked Ralph. "Although it requires practice to cut logs smoothly and rapidly yet you should have no real difficulty in cutting up six-inch logs."

"Well, there are the logs," remarked Tom as he led Ralph to the woodshed. "You can see how much impression I made with all my hard work."

His cousin stooped down, examined the log and burst out laughing. "I don't wonder you gave up in despair," he exclaimed. "Those are seasoned second-growth white hickory and are just about as hard and tough as iron. A sharp saw's about the only thing that would touch them."

"They looked just like any wood to me," said Tom. "What use are they if you can't chop them up?"

"They're not intended for firewood," replied

Ralph. "They were put away here to season for timber and these few logs are worth more than several cords of firewood. They are highly prized by wagon and carriage builders and by wheelwrights and you'll have no trouble in selling what you've on hand here for forty or fifty dollars."

"Well, what do you think of that?" cried Tom. "Imagine trying to make firewood out of logs worth all that money."

"Your difficulty in chopping these logs has given me an idea," announced Ralph a little later. "You'll have a lot of cutting to do and chopping is slow, hard, wasteful work at its best. I propose that we rig up a buzz-saw, run it by power and have a miniature sawmill."

"That would be fine fun," agreed Tom. "But won't it be very expensive? Of course I don't know anything about such matters but I imagine a saw and the power to run it would cost an awful lot."

"It would if you bought the outfit complete," replied the other, "but I've another plan. I own a small gasolene motor that was at one time in a motor boat and you can have that for your power plant. A saw mandril and pulley will cost only three or four dollars and a saw, capable of cutting any logs you'll want to saw, should not cost over

eight or ten dollars more. I'll show you how to build a saw-table and we can set up the motor and saw in the woodshed. I'll bring out the motor when I come with my luggage to-morrow morning and if you wish I'll buy the saw and fittings and save you a trip to town and by night we ought to have the saw-table done and the motor set up and ready to run."

"It's lucky you're here to help me," declared Tom. "I don't know the first thing about machinery or motors but I love to see such things work. I used to watch the sawmill near Fred Barton's for hours at a time."

"If you like machinery you'll have no trouble in understanding it," said Ralph. "A gasolene motor's a very simple machine, once you understand its principles, and you'll be surprised to find how many uses you can put power to on a farm. You'll be able to run a grindstone, saw your wood, churn your butter—after you have a cow—grind your meal for the poultry, cut bones for them, and pump water from your well—all without manual labor on your part and with an immense saving of time."

"Well, that's what I consider scientific farming," cried Tom.

"It's modern, sensible farming anyway," agreed

Ralph, "and after all the man who saves himself the most and takes every advantage of modern inventions, mechanics and science is the man who succeeds the best in the end."

"Couldn't I be working at the saw-table until you bring the motor and saw?" asked Tom. "That might save time and would give me something to do that will count. It makes me feel really helpless not to be able to accomplish more without aid."

"That's a good idea. Of course you can go ahead on the table," replied Ralph. "Make a frame of scantling—2x3 or 3x3 that the carpenters left here—about four feet wide and five feet long and fasten a stout support of scantling in each corner—like this." With pencil and paper he rapidly sketched the plan and dimensions. "Nail planks around the legs," he continued, "and cover the top with smooth boards leaving a space of 3-8 inch between the boards in the center of the table for the saw. Don't be afraid to use plenty of nails, Tom; strength is required more than fine work, but take care to have the corners true and the top smooth and level."

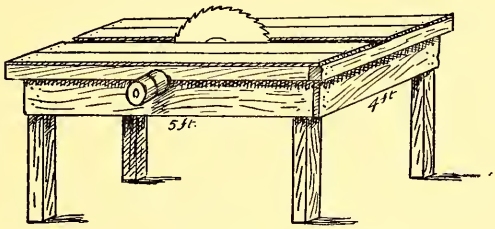
"That certainly looks easy," remarked Tom, studying the sketch. "I'll get to work at it first thing."

"I think it's perfectly wonderful that you know

"I used to watch the sawmill near Fred Barton's"

how to do all these things," exclaimed Kitty. "How on earth *did* you ever learn and how *can* you remember them all, Cousin Ralph?"

"Observation and a good memory, Kitty," laughed Ralph. "That's a combination that's hard to beat. But I expect within a year you and Tom



Saw-table

will know far more than I about farming, for after all experience counts more than anything else."

Tom commenced work on the saw-table as soon as Ralph left and labored industriously until forced to stop on account of darkness. He resumed work the first thing in the morning and by the time his cousin arrived the table was completed.

"That doesn't look like much of an engine," remarked Tom as he helped Ralph lift the motor from his car. "And there isn't anything to it hardly. I thought motors were all cluttered up with machinery and pipes and things. That's the way they look in an automobile."

"There's a big difference in motors," replied Ralph. "This is the simplest form there is. It's known as a single cylinder, two-cycle motor. Automobiles are usually equipped with four, six or even eight-cylinder, four-cycle motors. In two-cycle, or more properly two-stroke motors, there are but three moving parts which are absolutely essential. One of these is the shaft to which the fly-wheel is attached and which is in the form of a crank inside of the base of the motor, the second is the piston which fits tightly within the cylinder and the third is the connecting-rod which is attached to the piston at one end and is clamped to the crank at the other."

"I can't understand why it should run and give power," commented Tom. "It's always been a mystery to me. I can see how steam makes a steam engine go but gasolene motors are a puzzle."

"You'll find it simple enough," said Ralph. "As we set up the motor I'll explain what each attachment is for and then I'll make you a sectional sketch and you'll readily grasp the principles of the motor. Once you understand this engine you'll find others very easy."

Tom and Ralph worked busily and first prepared a bed for the motor, consisting of two heavy timbers firmly bolted to the sills of the woodshed. Across

these, two lighter timbers were firmly fastened, just far enough apart to permit the motor to set between them with the plates on its base resting on the timbers. Lag-screws were driven through the holes in the plates and the motor was thus secured immovably to its bed. "It may seem as if the bed is far stronger than necessary," remarked Ralph, "but even a small motor will shake and vibrate badly on a poor or light support and a firm bed is most important."

A heavy pipe was then attached to one side of the motor and led out through the wall of the shed. "That's the exhaust pipe," explained Ralph, "and if we leave it as it is the motor will operate but will make a tremendous noise, for the burning gases, after driving the piston, issue from the exhaust under great pressure. To stop the noise a silencer or muffler is used on automobiles and motor boats, but for your purpose a hole in the ground covered loosely with boards will serve every purpose."

At his cousin's direction Tom now attached the fuel tank, consisting of a 5-gallon oil can, to a shelf well above the motor and a slender copper pipe was carried from this to a brass device which Ralph screwed onto one side of the engine.

"This is known as a 'carburetor'," he said, "and

its purpose is to combine the gasolene and air in such proportions as to render it highly combustible."

"The next step is to find a tank for the water," said Ralph as he finished connecting the feed-pipe with the carburetor. "That empty cider keg in the lumber room will be just the thing."

The keg was set upright on a rough cleat frame slightly higher than the motor from which two pieces of ½-inch pipe were led to the keg, one entering the bunghole and the other a hole bored through the side of the keg close to the lower end.

"What on earth is that for?" asked Tom.

"To keep the motor cool," replied his cousin. "This is a water-cooled motor and a constant stream of water is kept circulating between the cylinder and this outer shell known as the water-jacket. The burning gases in the cylinder create an enormously high temperature and some means must always be devised to keep the motor reasonably cool. A great many motors designed for stationary use are provided with fins or flanges on the cylinders which radiate the heat and cool the motor. They are called air-cooled motors, but most automobile motors, boat motors and many stationary motors are cooled by water."

"I think I've seen air-cooled motors on motorcycles," remarked Tom. "I've often wondered why they had those ridges over them."

"Yes, the majority of motorcycles are equipped with air-cooled motors and some automobiles also use them."

"Won't the water freeze out here in winter?" asked Tom.

"It will unless we add some anti-freezing mixture to it," replied Ralph. "Denatured alcohol is as good as anything and I brought a gallon along with me."

As he talked he was busy screwing oil-cups into position and explained to Tom the importance of keeping the motor well oiled and the necessity of using the right kind of oil and the proper quantity. "And now for the electrical equipment," he remarked as the last lubricator was in place.

To Tom, the several wires, the batteries and the neat wooden coil-box were deep mysteries but as Ralph attached the wires he explained the use and principle of each so simply and fully that his companion had no difficulty in understanding them and even Kitty, who stood near by, intently watching the work proceed, declared she believed she understood all about the motor herself.

"The majority of motor troubles are due to electrical deficiencies," remarked Ralph. "So it's important that this portion of the equipment is well understood and is maintained in perfect condition. The batteries furnish the current on this motor, but in order to produce a spark of sufficient size and heat to ignite the gas in the cylinder the current is increased by means of this device called a coil. From the coil the intensified, powerful current is led to the spark-plug and a bright hot spark is produced when a connection is made with the batteries; see here," and Ralph touched a wire to the motor and pointed to the bright, blue, snapping spark that appeared between the two terminals of the plug.

"This spark occurs inside the motor each time the wheel and shaft reach a certain point in their revolution," continued Ralph as he screwed the plug into the top of the cylinder, "and the spark igniting the charge of gas causes an explosion which drives the piston down the cylinder and gives impetus and power to the shaft."

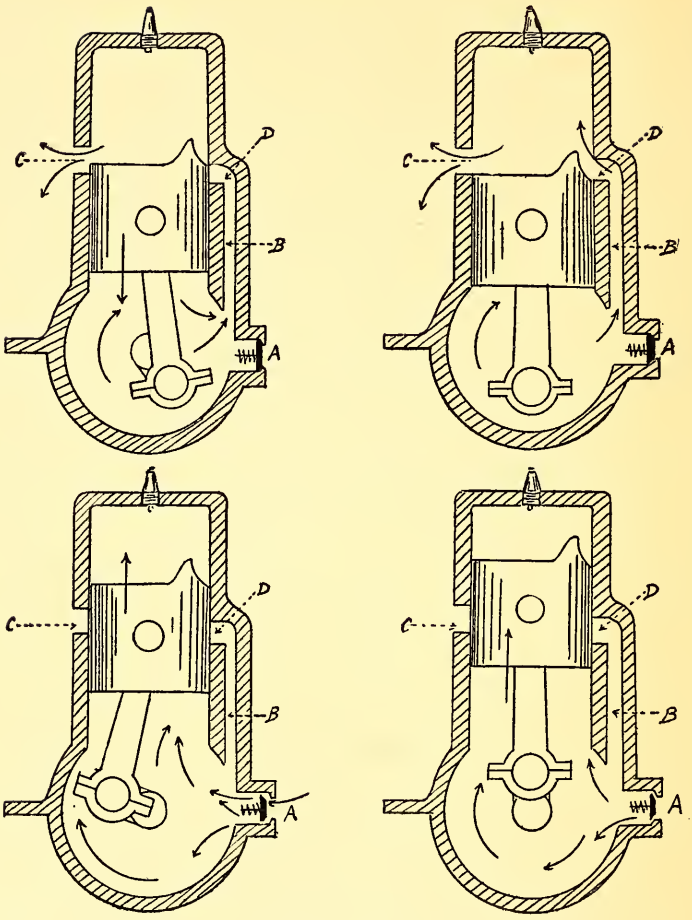
"Why, it's just like firing off a gun," exclaimed Tom. "But how do you load the cylinder in the first place, and what keeps it going?"

"It is very similar to the explosion in a gun as

you suggest," replied the other, "and in fact the first internal combustion motors, as they are technically termed, were designed to be operated by gunpowder. The cylinder is charged or 'loaded' as you express it, by turning the wheel over in this manner by hand." Ralph rocked the wheel back and forth. "This moves the piston up and down in the cylinder and sucks in a charge of air and fuel from the carburetor. Then when the wheel is brought completely over the charge is fired and the momentum of the fly-wheel carries the shaft clear around, draws in a second charge and carries the piston to the point where the new charge is ignited. This keeps on over and over again until the fuel or the electrical current is cut off."

"Then the only power the motor receives is on the downward movement of the piston," remarked Tom who had been watching and listening attentively.

"Exactly," exclaimed Ralph, "and let me compliment you, Tom, on so quickly grasping the idea. This is the reason why this type of motor is known as a two-stroke or two-cycle engine—because a power impulse occurs on every two strokes of the piston. The details of how the charge is taken in and how the exhaust escapes you can readily understand by this sketch." Ralph drew an outline in



Two-stroke Motor

chalk on the wall showing the motor in section. "This opening here marked A represents the carburetor," he continued, "and as the piston moves

up in the cylinder the suction draws a charge of gas into the base below the cylinder. The piston then commences to descend and the enclosed gas, unable to escape through the check-valve on the carburetor, is forced up through this opening B, and rushes through a hole in the cylinder walls which I'll mark D, and fills the space above the piston. At the same time the burnt gases rush out through the opening I'll mark C. The piston then commences to ascend and covers both C and D, thus confining the fresh charge in the cylinder and compressing it until the spark takes places and the explosion again drives the piston down."

"Why, it's just like an automatic pistol," cried Tom. "After the first shot it keeps on going as long as the ammunition lasts."

"Your comparison isn't bad," laughed Ralph. "But now that we've mastered the principles of our motor let's get the saw set up."

This was an easy job for it was merely necessary to bolt the bearings of the saw-mandril to the lower side of the table, slip the saw through the slot between the boards and place the pulley on the shaft.

"Now to connect the belt," said Ralph. "Fill up the fuel and water tanks and we'll be ready to try our sawmill."

"Why do you have a big pulley on the motor and such a little one on the saw-shaft?" asked Tom as he watched his cousin adjusting the strip of belting about the two pulleys.

"To gain speed," replied the other. "A buzz saw must run at very high speed and by carrying the belt from a large pulley to a smaller one we increase the number of revolutions at the saw. By doing this we lose some power and we would secure better results by carrying the belt from a small pulley on the motor to a large pulley on a shaft overhead and then carrying a second belt from another pulley on that shaft to a smaller pulley on the saw. We will do that eventually but I'm connecting the motor directly to the saw now merely for a test."

The tanks were now filled, the lubricators provided with oil and the switch turned on and Ralph rocked the wheel slightly, threw it quickly up and with a sputter and cough the motor chugged merrily. The belt whirred and slapped but the saw remained still.

"Why, the saw isn't running," cried Tom.

"Of course not," laughed Ralph. "The shaft carries a tight and a loose pulley which makes it easy to start the motor and obviates danger. To start the saw it is merely necessary to swing the

belt onto the other pulley in this way." As he spoke he pushed the belt sideways with a smooth stick. Instantly the saw sprang into rapid motion and hummed like a gigantic bumble bee.

Seizing a stout piece of timber lying near, Ralph pushed it across the table and with a whirr and a ring the saw severed it as if it were a straw.

"Hurrah!" shouted Tom and Kitty clapped her hands and cried "Splendid!"

Tom grabbed a stick and tried his hand and even Kitty delightedly pushed a piece of board across the table against the hungry saw.

"That's enough for to-night, I guess," said Ralph after all the available pieces of wood in the shed had been cut into short lengths. "But if you wish we'll give the saw a good test and try that hickory log you spoiled, Tom."

"Well, if the saw'll cut that I'll be satisfied," declared Tom.

Picking up the log the two placed it on the table.

"Easy now," cautioned Ralph. "You hold one end and I'll hold the other, but don't feed it too fast. Just press it slowly and gently against the saw and be careful to keep it straight. Later on we'll fix up a carrier for large logs. All ready, Tom?"

Slowly they pushed the log forward until it touched the saw. The saw growled and bit into the wood and while it slowed down somewhat it continued to revolve and slowly but surely penetrated deeper and deeper into the log and in a moment more passed the center and with a final, roaring whirr burst through the tough hickory and left Tom and Ralph each with a severed section of the log in their hands.

"Well, I call that simply wonderful," cried Tom. "There I worked for an hour and more chopping away at that log without making any impression on it and this little motor and saw cuts it in two in less than a minute. Gee! what a lot of labor that will save."

"Yes, it's the triumph of brains and science over brute force," remarked Ralph as he shut off the motor.

CHAPTER VI

A WELCOME MARAUDER

For several weeks nothing of great importance occurred. Selwin now resided at the farm and even on rainy, chilly days Tom found plenty to do with his cousin's help. The leaves had been gathered from the woods and spread upon the ground destined for a kitchen garden; the brush had been cleared up and stacked in piles and a large portion had been brought to the farm, where a quantity was put over the leaves to hold them on the garden. The choppers finished their work and beside the house fifteen cords of wood were stacked in symmetrical piles which gave the place a wonderful appearance of thrift and comfort. The hens were laying well and Kitty was delighted at the returns from their eggs at a season when fresh eggs were extremely scarce in the markets and brought a high price. Mr. Grayson had received his load of birch and hickory and the motor sawmill was proving a wonderful aid and its cheerful, busy sound could be

heard nearly every day for both Tom and Kitty delighted in seeing it cut through the tough cordwood. Several of Mr. Grayson's friends wished to secure a supply of wood and Tom talked over the matter with Ralph.

"I think you can easily secure enough to fill all the orders without robbing the woodland," said his cousin. "There are a number of the nut trees which will be improved by trimming and pruning, and I noticed that in a good many places the young growth was really too thick. Suppose we take a stroll through the woods and see just what can be done.

"It wouldn't do any harm to cut a firebreak through here," remarked Ralph, as they reached the center of the big stretch of timber. "That land on the hillside adjoining yours is covered with dead stuff and brush and leaves. If it should catch fire with the wind in this direction it might sweep your woods, and while you've cleaned up pretty well, still you might lose a lot of timber if the fire occurred after a dry spell."

"What do you mean by a firebreak?" asked Tom.

"Just a straight opening cleared of all growth and extending from one edge of the woods to the other," replied his cousin. "That will prevent the flames from traveling from tree to tree in case of a

fire, and any falling sparks or firebrands can be extinguished before they obtain much headway. By cutting the swath through the woods you will not only secure an additional safeguard from fire, but will obtain many cords of wood at the same time. If it is cut through this spot you'll scarcely need to destroy any valuable trees."

"I think that's a fine scheme," agreed Tom, "but there isn't much birch and hickory here."

"That's true," answered his cousin, "but you can sell all the birch and hickory you have on hand and replace it with the wood you cut here, and besides I think you can get out a number of cords by careful selection through the woods. It will be quite a job to get it out just now, but if it's cut and ready you can haul it easily after a good snowfall, and in the meantime deliver what you have on hand."

This was decided upon and in the afternoon Selwin went to town and hired a couple of good woodcutters whom Mr. Walton recommended. They had been working but a few days when the first snow of the season commenced to fall, and for two days the storm continued until the landscape was hidden beneath a six-inch mantle of snow and the countryside was transformed into a veritable fairy land.

"There's not much to be done outside until the

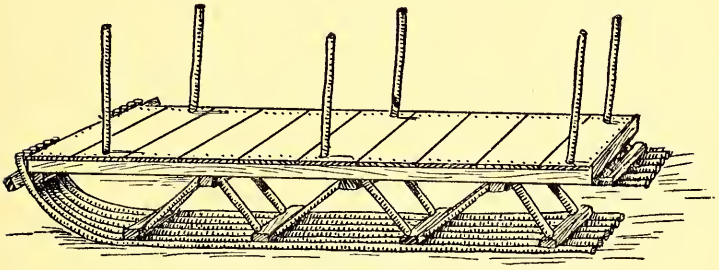
storm ceases," remarked Ralph, during the first day of the snowfall. "And it looks to me like a good old-fashioned snowstorm. It's a good time to get ready to haul your wood, Tom, and if you're willing we'll get to work and build a sled."

The roomy woodshed was selected as the workshop, and Tom and his cousin were soon at work. "This isn't going to be a fancy vehicle," announced Ralph. "But it will serve your purpose just as well, and, what's more, it won't cost anything but the labor."

A dozen straight, young, hickory saplings, about twelve feet in length and two inches in diameter, were first selected from a pile of poles and the bark was peeled from them and all stubs of branches trimmed off and planed smooth. Six of these were placed side by side upon the floor and were cleated firmly together with short pieces of oak. The other six were then treated the same way and, to Tom's question, Ralph replied that these were "for runners." "The sled will be a sort of double toboggan," he explained, "and will run on the snow instead of cutting through it. We could make a regular sledge with narrow runners which would do finely after the snow is broken down and packed, but

this will be far better for work in the woods and on the soft snow."

From the odds and ends left by the carpenters four pieces of two-inch plank were then selected, each four feet in length and in each of these, short sections of hickory poles were set at an angle by boring holes in the planks and driving the ends of the sticks into them.



The Sled

"Those look like little old fashioned benches," remarked Tom as the planks with their "legs" of round sticks were set aside.

"They're to serve as the crosspieces to your sled," replied Ralph, and with Tom's help he placed them across from one of the runners to the other with the straddling "legs" resting on the cleats already attached to the runners. With chalk, the spot where each leg rested was marked and holes were then bored in the cleats. The crosspieces were

then replaced, the legs driven firmly into the holes and nailed and Tom was greatly surprised to find how firm and rigid the framework was. The next step was to board over the framework with pieces of plank nailed firmly at right angles to the cross-pieces and a stout piece of timber was then bolted across one end of these boards.

"Now comes the hardest part of the work," remarked Selwin, and with his cousin's help one end of each pole forming the runners was bent upward and nailed to the cross timber. Another stout cross-piece was bolted in front of the ends of the poles, a pair of shafts was attached to the forward end of the affair, upright posts were set along the top and Ralph pronounced the sled complete.

Tom could scarcely wait to give the sled a trial and first thing the next morning he brought the horse to the woodshed and harnessed him to the odd vehicle. The sled was a great success and traveled smoothly and easily over the snow as Ralph had predicted.

"While the horse is hitched up we might as well bring in a few loads of wood," remarked Tom. "Come along, Ralph; jump aboard and we'll drive over to the woods."

"Let me come, too," cried Kitty. "It will be my

first sleighride and I'm as crazy as a child to get out in the snow."

The woods were really beautiful and Kitty was entranced at the delicate, lace-like appearance of the twigs and branches sharply outlined by their coating of clinging snow.

Tom and Ralph set to work diligently, placing the cordwood on the sled until it was piled high with the logs.

"What are all these queer marks in the snow?" asked Kitty.

"They're footprints of wild things," replied her cousin, "birds and animals of many kinds."

"Why I didn't suppose there were enough creatures in the woods to make so many tracks," exclaimed Tom, "the snow's just covered with them."

"Few people realize how abundant life really is in the woods," said Ralph, "for the wild things keep out of sight and many of them hide away during the day and only come forth after dark. It's an interesting matter to study these autographs left behind by the denizens of the winter woods. They often tell us a great deal of the creatures' lives and habits."

"I don't see how you can tell anything about the creatures by these marks," remarked Tom. "They

look like so many holes and lines in the snow to me."

"That's because you've not learned to recognize and distinguish them," replied Selwin. "Let's stroll a short distance into the woods and I'll try to show you how much the trails tell us and how easy it is to read the story written on the snow."

"Here," he remarked as he stopped and pointed to three, rounded imprints arranged in a sort of triangle, "is the trail of a rabbit. Follow them back and we'll no doubt find the hiding place from which he started forth, but that is of less interest than to follow his tracks and see where he went." Leading the way Ralph traced the rabbit's track around trees and over stumps and logs for some distance. "Here he stopped to gnaw at this young birch shoot," he said as he pointed to the barked stem with the tiny chips of bark on the snow beside it, "and here," he continued, "the little fellow dug through the snow to secure some morsel beneath." Ralph showed his two cousins a little hollow scraped through the snow to the earth below. A little farther on he stopped and exclaimed: "Ah, the story is getting interesting; our little friend has an enemy trailing his footsteps. See these larger, circular tracks? Those are the marks left by a hungry fox

who has scented the rabbit and is following after to secure a nice meal."

"Poor little rabbit," cried Kitty. "I do hope the fox doesn't catch him."

"We'll soon find out," said her cousin. "See, the rabbit knows he's being followed and is hurrying. You can tell by the fact that the triangles that mark his jumps are farther apart and the hind feet reach ahead of the forefeet." Ralph stopped and explained the signs to Tom and Kitty who had become intensely interested.

For some distance the three followed the two trails until they led to the edge of a tiny, open glade.

"Here's the end of the story," announced Ralph, pointing to a disturbed, tumbled spot on the snow. "The fox was too late, his tracks cease on the edge of the clearing and turn and swing off to the left, but the little rabbit met with a sad fate just the same. Notice these tiny blood-stains and these fan-like impressions on the snow. They tell the tale just as plainly as if it were printed on a page of paper. The rabbit, hurrying across the glade, was spied by a waiting owl, who swooped down from above and seized his prey from beneath the very jaws of hungry Mr. Fox who, robbed of his break-

fast, turned about and hurried off in search of other victims."

"Isn't that marvelous!" exclaimed Kitty.

"And to think I might have tramped over these woods for a week and would never have known that these marks in the snow meant anything at all," said Tom.

"But I still don't see how you can tell it was an owl that caught the poor rabbit," remarked Kitty.

"That's easy," laughed Ralph. "Only a hawk or an owl would have swooped down upon him and the marks left in the snow show rounded wings and soft feathers. A hawk's wing would be pointed and the feathers are stiff."

"I can see that now," remarked Tom, "but it's evident one has to know a lot about natural history to read these 'snow stories,' as you call them."

"Observation will soon teach you all this and more," replied Selwin, and as they strolled back towards the sledge he pointed out the tracks of mice, squirrels, crows and even the spot where a grouse had broken through the snow which had covered him and had flown off to his feeding grounds.

Although the sled was heavily loaded the horse had no difficulty in hauling it across the fields to

Calling the boys to lunch

the farmhouse and a number of trips were made before Kitty summoned Tom and Ralph to lunch.

When the snow at last ceased falling and they were tired of hauling wood Ralph suggested that they should "break a track" through the road.

"Farmers always take pride in being the first to break a road with their teams," he explained, "and I'll warrant that none of the neighbors have gone over the road with their heavy, narrow-runnered sleighs or sleds yet."

"Bully! We'll show them something new in sleds," cried Tom, and in a very short time the three were traveling merrily over the snow-covered road toward town and leaving a broad, hard-packed trail behind them.

Gran'ther Joe was busy hitching his horse to a huge, weighty sledge when they reached his house and looked up in surprise at their cheery greeting.

"Well, I declare!" he exclaimed. "Ef ye hain't licked all us old sittlers a gittin' through before enny on us. Where in Sam Hill *did* ye git that there bob ennyhow?"

"Made it, ye say; well, well, 'tis a queer lookin' contraption, I'll be bound. Hauled three cord o' wood on it this mornin', ye say. Consarn it all!

Reckon I'll hev to make one like it myself. Ain't nothin' like book larnin' arter all."

Clear to the state road and the trolley line the party drove and then retracing their way they continued on past their farm until they reached the crossroads. At every house they passed they were greeted with surprise and each and every farmer declared the new sled a huge success and all vowed they'd make others after the same pattern.

"I knew we could make these farmers sit up and take notice," declared Tom as with hearty appetites and glowing cheeks they reëntered the house. "We've scored with the sled, thanks to you, Cousin Ralph. I wonder what Uncle Ab. would have thought of it."

The next morning Tom went forth as usual to feed his hens but in a moment or two came rushing back.

"Do come here, Ralph," he cried. "One of my hens is missing and the others are frightened half to death and the snow's covered with blood and feathers."

Selwin hurried to the poultry yards with Tom, who pointed to a trampled, blood-spattered area of snow just within the netting enclosure and to a trail

of tiny red spots leading away from the yards toward the fields.

"Our woodlot prowler the fox has made you a visit," announced Ralph after a short examination of the tell-tale tracks.

"But how on earth did he get into the houses?" asked Tom, puzzled.

His cousin glanced about for a moment. "You furnished him with a nice, convenient road," he replied. "These boards which you left leaning against the side of the house provided a stairway by which Reynard made both his entrance and exit; see, here are his footprints."

"Well, he won't get in again that way," declared Tom as he started to remove the boards.

"Hold on," exclaimed Selwin. "Don't touch the boards. We'll take advantage of the thief's ladder to capture him red-handed."

"But I can't afford to lose any more hens," remonstrated Tom.

"You won't have to," replied Ralph. "We'll set a trap on these boards to-night and catch Mr. Fox when he makes his next visit. His skin will be worth several times the value of the hen, so you ought to be grateful to him."

"That will be great," admitted Tom, "but where will we get a trap?"

"We could buy one in town," replied his cousin, "but I don't think it will be necessary. I expect Gran'ther Joe has some traps; after breakfast we'll run over and ask him."

The old farmer had several steel traps, two of which Ralph borrowed and in the afternoon they were carefully set; one half way up the boards and the other inside the enclosure close by the door to the hen house.

"We'll close the door except for a small crack," explained Selwin, "and place the trap right in front of the opening. The fox may suspect the trap on the boards, although as you noticed, I smoked it over the fire to destroy its scent and took care not to touch it with my bare hands, for the least human smell about the trap would serve as a warning to the fox. If he avoids the trap on the board and tries to poke his way into the house he'll hardly escape stepping in this second trap."

"Aren't you going to fasten the traps to the fence or house?" asked Tom.

"No; if we did that the fox when captured would be liable either to pull himself free or else might break or bite off his leg to escape. It's a better

plan to attach the chains to pieces of cordwood. The fox can pull these along, but they'll catch and drag and hinder him so much that he can't travel far nor fast."

Tom was so anxious to see the results of their trapping experiment that he hurried to the poultry yard before it was fully light the next morning. He glanced at the boards but nothing appeared disturbed and he stepped round to the enclosure and peered within.

Instantly he gave a shout and hurried back to the house.

"We've got him," he cried. "But it's not a fox, Cousin Ralph. I don't know what 'tis. Hurry along out and see it."

At the news Ralph and Kitty threw on wraps and rushed after Tom. Crouched in a corner of the wire-fencing and snapping viciously at his captors was a sleek, dark creature with one forefoot held securely by the jaws of the trap.

Selwin gave a single glance at the captive and slapping Tom on the back, cried out: "My, but that *is* a fox! Tom, you *are* in luck."

"Why, I thought foxes were red," exclaimed Kitty. "That poor little creature is black."

"That's just it," declared Ralph. "Most foxes

are red or gray, but this is a black fox. Why, that fellow's skin is worth anywhere from $150 to $200, the exact value depending upon the quality of the fur and the amount of white hairs among the black. They're one of the most valuable of all fur-bearing animals."

"Hurrah!" shouted Tom. "That's what I call good profit from an old hen that wasn't laying anyway. Who says poultry isn't profitable?"

"You can't count on such luck every time," laughed Selwin. "Black foxes are just freaks. You might trap foxes for years and never get another. There's many a trapper who's spent his lifetime in the woods and never saw or caught one. That's why they're so valuable."

"Well, let's get him out of there and kill him. He might get away," suggested Tom.

"That's the very worst thing you could do," declared Ralph. "If you kill that fox you'll regret it all your life. It's killing the goose that laid the golden egg with a vengeance."

"Well, how are we to sell his skin if we don't kill him?" demanded Tom.

"If you take my advice you won't sell his skin," replied his cousin. "But you'll keep this fine fellow and start a silver or black fox farm and make a hun-

dred times as much as if you killed him and disposed of his hide."

"What in the world do you mean, Ralph?" asked Tom. "Who ever heard of a fox farm?"

"Lots of people," replied Selwin. "Not about here, I'll admit, but in Maine, Alaska, Prince Edward's island, Newfoundland and many other parts of the country fox farming has become a most profitable industry. Red and gray foxes pay well enough but a good black fox farm is better than a gold mine."

"You mean we can raise black foxes for their skins?" queried Tom. "I don't see how we can start a farm with one fox and you just said we might never get another."

"You don't need another black fox," declared Ralph. "Just keep this fellow and buy, trap or capture some common foxes and the chances are that some of their young will be black or partly black. By selecting the best of these and breeding and continuing to weed out those which are reds or ordinary grays you can very likely obtain a pure or nearly pure black breed. The reds and grays will pay for the expense and even if you secured but one good black skin a year you'd be well repaid for the labor and trouble."

"That *is* a scheme," cried Tom. "It beats hens all to pieces."

"It's a branch of modern farming," said Selwin. "Not only foxes but skunks, muskrats, beavers, minks, and many other fur-bearing animals are raised profitably on farms nowadays and the principal reason that black fox farms are so few is not because of the difficulty in raising the animals or lack of profit in the business, but because healthy, live, black foxes are so extremely valuable. By a streak of luck you've got hold of a prize stock animal for the price of an old hen."

"It sounds reasonable," admitted Kitty, "but it seems a shame to rear animals just to kill them for their skins."

"You must remember, Kitty, that the foxes live a far easier and happier existence in captivity than when wild and that in rearing them we are really protecting wild animals, not destroying them. As the country becomes settled and cultivated foxes and similar creatures *must* be destroyed and will soon disappear altogether. Moreover, if we didn't rear them they wouldn't ever exist and finally why is it any more cruel to raise foxes and kill them for *their* skins than to raise hens, lambs, calves or any domestic animals and kill them for meat and hides?"

"I don't suppose it is, come to look at in that way," agreed Kitty, "and after all I suppose the more foxes that are kept in confinement and killed the more harmless and nice creatures and birds there will be. I was just thinking of the rabbit that was trailed by the fox in the wood."

"Well, what I want to know is how we're going to get this fellow out of the trap and where we're going to keep him," said Tom. "We can't leave him in that chicken-house yard."

"That's just my idea of what we *can* do," replied his cousin. "We'll move the hens out, add a horizontal strip of netting around the top of the run, place a wire netting fence across the end of the house and Mr. Fox will be perfectly safe until warm weather. Then we'll add some buried netting around the fence, to prevent him from digging out, and will place brush around the fence as a screen and will transform your chicken house into the nucleus of a fox farm. We might as well commence now for the sooner we get the place ready and take the fox from the trap the better; it's needless cruelty to leave him there and it will do him no good."

Before breakfast was ready the hens had all been removed and the strips of additional netting added to the fence. Ralph, approaching the captive with

an old horse blanket, threw it over the fox's head, removed the trap and retired with Tom to let the creature quiet down from his fright and hurts.

Tom was highly elated over the prospects of rearing black foxes and could talk of nothing else.

"I always thought all the furs came from the far north," he remarked. "I didn't know there were any animals with good furs around here."

"The northern skins are always heavier and better," said Ralph, "but your farm is almost within the so-called 'Canadian Zone.' This is an area determined by the government experts and within which furs of the best quality may be procured. The southern boundary crosses Maine, New Hampshire, Vermont, Michigan, Wisconsin, Minnesota and North Dakota and extends southward along the mountain ranges of New York, Pennsylvania, West Virginia and throughout the Rocky Mountain states. South of this boundary foxes with a fair quality of fur may occur but the best are only obtained within that area. As your farm is on high land and only a few miles south of the imaginary boundary there is no reason why you should not raise fox skins of high market value. It might not pay for common furs but the gray foxes, blacks and silver grays are

so valuable that even inferior skins are worth a great deal of money."

"Sometimes you say 'black' and at others 'silver grays,'" remarked Tom. "Are they both the same?"

"Not exactly," replied Ralph, "although one grades into the other. All our common foxes—with the exception of the 'southern tree-fox' or 'southern gray fox'—are varieties of the same animal. The normal and commonest color is reddish with some black on the feet and ears and a white tip to the tail. From this type the species varies through innumerable shades of mixed red and gray to the variety known as the 'Cross Fox' in which the feet, legs and lower parts are mainly black and the upper parts blackish and reddish mixed. More black and white and less red gives the various 'grays' until in the 'silver gray' no red is visible and the color is entirely black with white tips to the hairs. The silver gray grades so gradually into pure black that it is hard to say where one ends and the other begins, but in the true 'black fox' there is no white save at the tip of the tail. Any one or all of the varieties may occur in a single litter of young. I knew an old farmer in Maine who dug out a nest of foxes and sold them to a friend for $5.00. Of the

five cubs two grew up into silver grays, one into a pure black and the others into common red foxes and the purchaser of the litter netted something over $500 profit. That was a number of years ago and to-day the skins would bring more than twice as much."

"That would have been a fine lot to start farming with," remarked Tom.

"Yes," agreed Selwin, "but at that time fox farms were undreamed of. You're just as likely to secure good skins with one pure black parent like your captive. You must not expect to secure blacks or grays the first generation, however. It may happen; but usually every other generation is more likely to develop the peculiarities of its ancestors. For that reason grays and reds should not be eliminated until they have been bred for at least two years. A pure red which is the offspring of a red and black fox might produce a litter in which several were high grade cross-grays, silver-grays or even blacks."

"Are foxes hard to feed and care for?" asked Tom.

"Not at all," replied his cousin. "The principal care needed is to see that they are not frightened by dogs or people, that they are disturbed as little

as possible, are not overfed and are provided with clean quarters and shade."

"Me for fox farming, then," declared Tom. "But where can I get some more foxes?"

"We'll try to trap some in the woods," answered Ralph, "and perhaps in the spring we can find a fox hole and dig it out and in this way obtain five or six young which may be reared in confinement. They will usually do better than full-grown trapped animals but I've no doubt if we succeed in catching some they'll soon become accustomed to a life of captivity."

"There's only one objection," remarked Tom after a few moments' thought. "If my fox gets out or dies I'll lose all chances of raising more and I'll be out the value of his skin besides."

"There is that risk, of course," agreed his cousin, "but there's some risk in everything that has prospects of large profits. You can sell your fox for $300 very likely, either for his skin or for a breeding animal and that will be the end of him. On the other hand, you can take the small risk of his loss and at the same time have a good chance of making many times as much yearly as you'd receive for him today; it's up to you to decide, Tom."

"Well, I'm going to take the risk, then," Tom declared. "We didn't count on foxes as part of the farm profits anyway, and if I should lose him I'll really be out only one old hen."

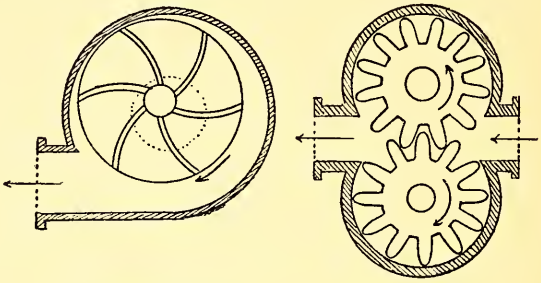
CHAPTER VII

PLANNING FOR THE FUTURE

Now that winter had set in and the country was snowbound there was little to be accomplished out of doors. Trips to town to deliver eggs and wood, to the grist mill to secure feed for the poultry and horse and the care of the live stock comprised Tom's duties in the open air and most of his time was spent in the house, talking with his cousin, reading books and magazines and planning for the coming spring. Ralph had helped Tom connect a grindstone to the motor, a counter shaft and pulleys of various sizes had been rigged up overhead and Ralph had explained to Tom how pulleys could be made to increase or decrease power.

"You'll find a pump a great convenience," he said on one occasion. "As it is now you have to draw water from the well for everything. With a power pump you can pump running water to the barn and house and save a great deal of time and trouble. Moreover you can build a concrete tank or cistern

and keep it filled with water. Then when a dry spell comes on you can save your well and let the water accumulate in it. You might even do better than that. I noticed an old wind-mill tank at the grist mill the other day. If you can get that we could set it up on the barn or on a platform and by pumping



Centrifugal Pump Gear Pump

water to it you could obtain a supply of running water for both barn and house."

"I think that would be great," replied Tom. "But wouldn't it take a lot of time and trouble to run the motor to pump water enough to fill a tank?"

"It would with an ordinary pump," agreed Selwin, "but if you get a rotary or centrifugal pump it will fill the tank in short order. A rotary pump is a very small, compact affair consisting of a case containing one or two wheels with teeth or paddles upon them. In the centrifugal form the rapidly revolving paddle sucks the water into one side of the

case and forces it out through an opening in this manner." Ralph illustrated the principle with a sketch. "The other form, known as a gear-pump, is a case containing two interlocking gear wheels. The water is drawn in by the suction of the gears and is forced out as the teeth come into contact, in this manner." He made another outline of a gear pump.

"Those look very simple," admitted Tom. "Are they expensive?"

"They're very cheap—a two-inch pump costs about $15.00 and a little later on I'd strongly advise getting one. There isn't any use in trying to fit up the tank and pipes now as they'd freeze, but as soon as thaws commence we'll begin on them and make the most of the water from the spring rains and melting snow. You'll be mighty thankful if we have a drought that you've an auxiliary water system."

Tom had also constructed a number of bird houses to be placed in the trees about the house, for Kitty had become greatly interested in the feathered visitors and by placing crumbs, pieces of fat and suet and similar tidbits about the veranda and on nearby posts and trees she had attracted many winter birds to the farm.

"I'm glad you're encouraging them," said her cousin one day as they stood watching a flock of chickadees and nuthatches pecking away at the food. "Birds will be our best friends in the spring and summer. A single nuthatch will destroy more injurious insects in a day than you could destroy in a year. Attract all the birds you can, encourage them to nest about the place and never allow a cat about and you'll have few losses from insect enemies."

"I suppose that's all a part of scientific farming," said Tom.

"It certainly is," Ralph assured him. "You'd be surprised to find to what trouble and expense our government has been to study the habits of insects and birds in their relation to farm life and agriculture. Thousands of birds' stomachs are examined yearly and vast numbers of reports have been issued and distributed in an effort to induce the farmers to protect the birds and thus save their crops from the ravages of insects. In many places the people are awakening to the valuable aid rendered by birds but in a majority of cases the farmers are inclined to underestimate their use and to scoff at what they consider new-fangled ideas. As a matter of fact while insects are increasing in proportion to the increase of cultivated crops and many new for-

eign species are being introduced, their natural bird enemies are decreasing through persistent and ruthless hunting, destruction of their nests and eggs and the abundance of domestic cats."

"Well, all birds are not useful," remarked Tom. "Fred Barton's father used to pay us five cents apiece for bee-martins, ten cents for blackbirds and a quarter for crows. He said they ate his bees and fruit and corn."

"That shows Mr. Barton's ignorance and shortsightedness," declared Ralph. "Bee-martins, otherwise known as Kingbirds, *do* eat a few bees at times but they devour vast numbers of injurious insects and make up for the bees they kill a thousand times over every day. Blackbirds may be a nuisance sometimes and may help themselves to fruit or grain, but if Mr. Barton and others like him would take the trouble to investigate he'd find the stomachs of his victims were usually filled with beetles, grubs, worms and similar farm enemies. Even the crow is probably far more useful than injurious in most places. Crows *do* eat corn and in some places are too abundant to be pleasant, but in most cases they prefer grubs and worms to corn and are too few in number to do as much harm as good. One fact which we are all too likely to overlook is

that while the birds *may* eat some of our things during their season, yet during the balance of the year they depend entirely upon insects and weed-seeds."

"I never thought of that," admitted Tom. "But I can see how sensible it is. I'm going to protect every bird on my place except hawks and owls."

"And you'll protect them also if you're wise," said Ralph. "Only one or two species of owls and very few hawks are injurious."

"Why, I thought they all ate chickens," exclaimed Tom.

"A few kinds do," replied his cousin, "but you must learn to discriminate. A farmer would never destroy a valuable plant merely because it resembled a weed and yet he doesn't think it worth while to learn the differences between useful and injurious birds, animals or reptiles or even between harmful and useful insects."

"Well, this is all news to me," declared Tom. "I didn't suppose any insects were useful nor any reptiles and I thought all hawks and owls were enemies of the poultry."

"The hawks commonly called 'chicken hawks' or 'hen hawks' are large, slow-flying, sluggish birds and feed almost entirely on caterpillars, frogs, snakes, meadow mice and other small creatures,"

replied Ralph. "The small, swift-flying 'pigeon-hawks' are far more injurious and only a few species of these—such as the Cooper's hawk, Sharp-shinned hawk and the various falcons are really worthy of being considered enemies. It is the same with the owls, the great-horned owl and the snowy owl will destroy chickens, hens and poultry, but the common screech owl, the other medium-sized owls and the barred owl all depend for a livelihood upon small animals, insects and reptiles. Among the reptiles all of the non-poisonous snakes are good friends to the farmer and devour vast numbers of insects, small mice, etc., while the common toad is one of our best friends and an insatiable insect destroyer. Among the mammals the meadow-mice and field-mice, the gophers and ground squirrels as well as the wild rats are all enemies and should be destroyed, but the moles and shrews live upon insects and are useful. Even among the insects we have many good friends. Lady-beetles are the greatest of enemies to the obnoxious and destructive scale-insects and plant-lice; numerous beetles devour insect pests of many kinds; nearly all wasps, bees and hornets are destroyers of other insects; spiders are great friends of ours; the ichneumon-flies annually kill millions of caterpillars, and it's the same with

many other groups. I'll give you a good book to read on this subject and I'd also advise studying government pamphlets and bulletins."

Tom found these books most interesting and with Ralph's help he commenced diligently to study the lives of insects, birds, animals and reptiles of his vicinity.

"I never dreamed there were such hosts of live things about," he remarked. "And so many of them so interesting. Why a fellow might spend all his time just studying these creatures and watching their habits. It's like a fairy-tale."

"It's far better than any fairy tale," said his cousin. "And everything you learn will help to make your farm more successful. If our farmers paid more attention to natural history and studied the government pamphlets and reliable scientific works instead of reading cheap weekly magazines and 'farmers' almanacs,' there'd be less complaint about poor crops and mortgaged farms."

Kitty now had a girl to help with the housework and found much of interest in reading and studying flower culture and in discussing matters relating to farm life with Ralph and Tom. As they sat in the cozy room before the big, blazing log fire with the nipping cold winter wind howling about the house,

it was hard to realize that they were actually in the forlorn-looking old place which had seemed so hopeless when they first saw it.

Before Christmas, Kitty's violets were blooming and her bulbs were well budded and nearly every day she sent orders of flowers to customers in town. The rural delivery proved a great boon in this work and even the eggs were sent to Mr. Grayson and their few other customers by post.

Tom had constructed a number of artistic and handsome window boxes from rough boards covered with ornamental bark from their woodpile and had also devoted a great deal of time to building chicken coops, brooders and similar appliances for his poultry yard, for he realized that the winter was the time to complete all such odds and ends of work and that during the spring and summer he would have his time fully occupied in caring for his land and crops.

He had also secured a number of additional sash and had constructed the frames for several large hot beds, for Ralph assured him that he would require large, roomy hot-beds if he was to raise early vegetables. The fox had become thoroughly accustomed to his new home and seldom snarled or crouched when Tom approached. He was healthy

and sleek and had entirely recovered from his wounded leg.

Old Gran'ther Joe stopped in quite often as he passed the farm, and when he heard of the fox and Tom's proposed fox farm he laughed heartily.

"Wall, I've heerd o' all sorts o' farmin'," he announced. "But a-farmin' of foxes do beat all. I ain't a sayin' nothin' agin it, though. Sence ye beat us all with thet there sled o' yourn an' hev been a-gittin' eggs all winter, when our hens hain't laid a egg fer nigh onto three month, I says to Mandy, 'Mother, there beint no use a-talkin', book-larnin' *does* pay an' I 'clare to goodness I wisht I wuz young enough to start in an' do some book-larnin' myself.' "

When he saw the fox he expressed the greatest surprise. "Gosh all Hemlock!" he exclaimed, "if thet there ain't a mighty purty critter. I've seed foxes all my life but I hain't never seed one like thet. I tell yer what, son, come spring I'll show ye where there's been a den o' foxes fer nigh onto three years an' ye can dig 'em out an' hev as purty a little fambly o' varmints as ye'd wish ter see. Hope yer make a mint o' money out o' them critters an' I bet ye do."

Several traps had already been set in the hope of

capturing another fox but it was not until late in January that success resulted and a fine red fox was secured. The new captive was placed in the pen with the black and Tom and Ralph watched from concealment to see if the two showed signs of fighting. For a short time the red animal sniffed about suspiciously and showed her teeth at the other but there seemed to be no antagonism and Tom and Ralph quietly withdrew and left the creatures to get acquainted at their leisure.

It was a cold severe winter but this, Ralph assured Tom, gave all the more promise of a warm and early spring and as the days began to lengthen the three spent many hours talking over the cultivation of their land and the planting and growing of crops. Tom had secured innumerable catalogues of vegetable seeds and farming utensils and he went over these carefully with his cousin.

"The first thing," Ralph remarked, "is to decide just what you're to raise. Certain crops may be very profitable in one place and under certain conditions, whereas the same things in another district and with a different market may not pay at all. Moreover, you'd find it mighty hard work to make some crops pay, as in order to grow them profitably

you must employ several helpers and must use horse and machine tools for cultivating, fertilizing, etc.

"As a rule the really cheap things do not pay, except on very large farms and on a grand scale and where transportation is cheap and frequent to large markets. Strangely enough far more farmers raise such things than the more profitable and more easily raised crops which always bring a good price and are more in demand. You'll often see farm after farm devoted to cabbages, corn, potatoes or some one or two crops and as a result the owners cannot dispose of all they raise for enough to pay for the harvesting. A general garden or truck farm is far more profitable than a farm on which but a few crops are grown and I'd advise you to specialize in the very finest and best varieties of vegetables. A great many farmers find vegetables do not pay merely because they plant cheap seeds, and inferior or late varieties, and as a result they must sell at a very low price or not at all. The very best seed costs but little more than inferior seed, the latest and most highly perfected varieties are just as easy to raise as the old-fashioned kinds and the earlier the crop the higher price it will bring. Consumers soon learn to discriminate and if you earn the reputation of having better, fresher and cleaner vege-

tables than others you will have no difficulty in finding a ready sale for your crops. Your best customers will be the hotels, restaurants, boarding houses and private families and if you make inquiries you can no doubt determine about how much of each vegetable your prospective customers use. Early things are always in demand and by planting radishes, cucumbers, tomatoes and many other vegetables in cold-frames and hot-beds you can have your crops on the market long before the other farmers, who wait until really warm weather before planting. The success of your farm, however, will depend mainly upon three things: Constant care, preparation of the soil and a rotation of crops."

"What do you mean by rotation of crops?" asked Tom.

"Having one crop always in the ground," replied Ralph, "and not letting any land lie idle. In this way less land can be used, consequently requiring less work and care, and the land is made to yield its utmost. Most of our farmers are content to get one, or at the most two, crops a year from their land and yet three, four or even five crops may be easily grown on good land under ordinary circumstances. Thus if early peas are planted they can be harvested by June and corn or some similar crop

can be planted on the same land and will be ready to gather in season to plant celery for the autumn and as soon as the celery is out of the ground spinach, kale or some winter crop may be started. Of course this rotation of crops uses up the soil rapidly and more fertilizer is required, but the results from this 'intensive' gardening, as it's called, are enough to warrant the additional expense of manure. Moreover, peas, vetch, clover or some other leguminous plants may be sowed among the corn and as these 'legumes' have the property of adding to the richness of the soil they will serve in place of a great deal of fertilizer. Most farmers are ignorant of the value of fertilizers, except in a general way, and know little about mulching, the necessity of humus or even how to prepare the earth properly to get the best results."

"What are mulches and humus and what does the ground require except plowing?" inquired Tom. "I thought farming was easy, but there seems to be a lot of things to remember."

"Any material placed on top of the soil to retain the moisture is a 'mulch'," explained Ralph. "You know how damp it always is beneath a board, stone or other solid object that rests on the ground. Leaves, litter or any other material which will re-

tain moisture will accomplish the same results, but the handiest and best of all is a well-worked layer of the earth itself. It is to make this earth act as a moisture-retainer that the surface is broken up, hoed and pulverized between the plants; for a dry, fine, loose upper surface means a damper soil beneath than when the surface is allowed to become baked, caked or hard. Moisture *in* the soil, *not* on *top* of it is necessary and while a hard, caked surface may retain the moisture and become mud during a rain, yet the moisture does not penetrate to the plants' roots, and dries up and evaporates quickly, instead of being retained beneath the surface. Humus is decayed animal or vegetable matter in the soil and this acts not only as a fertilizer but makes the land mellow, easily-worked and soft and retains moisture as well. Stable-manure, litter, leaf-mold or any similar materials are excellent for forming the humus and it was for this purpose that you placed the leaves from the woodlot over your field. In addition, you should have a compost-heap, for compost is the best of humus and fertilizer combined."

"What's a compost heap?" asked Tom. "You'll have to explain these things as you go along, Ralph, they're all Greek to me."

"A compost heap," replied his cousin, "is a pile of refuse, waste and odds and ends so arranged as to decay and form humus and fertilizer. All the offal from the kitchen, stable and poultry yard should be gathered together in some out-of-the-way spot and piled up with layers of soil, straw, dead leaves, sods, etc. As the mass increases in size land-plaster, wood-ashes and slaked lime may be added and when the heap is three to five feet high a thin layer of soil should be thrown over it and the surface of sides and top sown with clover, vetch or cow-peas.

"These leguminous plants will transform the unsightly pile into an attractive green mound and their growth will add to its richness as all of these plants absorb nitrogen and give it to the soil in which they grow. The compost pile should remain over winter and in the spring it should be turned with a fork and sown with more seeds. During the summer the plants will hide the mass and in the autumn it will be thoroughly decayed and ready to plow into your gardens."

"We can't do that now," objected Tom, "it's too late for this year."

"You can start the pile at any time," Ralph assured him, "and by spring sow the first legumes

on it. By autumn it should be ready. Plowing the land properly is most important and nine times out of ten plowing is not deep enough and the hard, compact subsoil is not sufficiently broken up. Soil properly prepared should have the subsoil fine and even, with the surface loose and dry, whereas, improperly prepared earth is just the reverse; the subsoil being coarse and lumpy, so the moisture is not retained, while the surface is finely pulverized and becomes caked and impervious to water when wet."

"Your soil should be broken as deep as possible with a 16-inch plow, followed by a disk plow, after which it should be harrowed twice over both ways and finished with a brush drag."

"Whew! It makes me tired just to think of all that work," exclaimed Tom. "I helped Fred Barton plow a little and it seemed to me as if we did about as much work as the horse."

Ralph laughed. "It *will* be hard work," he agreed, "but it's worth the labor and next year 'twill be easier. With a pair of horses you'll not find plowing so difficult, especially as your land is mellow and light."

"As we haven't any manure to speak of I suppose I'll have to buy artificial fertilizers," said Tom. "What's the best kind to use?"

"That depends partly upon the plants you grow," replied his cousin. "Most commercial fertilizers are either 'general crop fertilizers' or are prepared with reference to their value to certain crops. The chemicals which are mainly required by plants are phosphoric acid, nitrate of soda and potash. Some soils lack one and some another and the fertilizer that will give the best results is the one which furnishes the chemicals lacking in the particular soil upon which it is used. Then again some plants require more nitrates and others more phosphates than others. Still others fail entirely in an acid soil while others amount to nothing unless the soil *is* acid. For garden crops a soil of average richness and containing plenty of nitrates and phosphates is the best, and the best fertilizer for all such crops is well-rotted stable manure. The only objection to it is that it contains many weed seeds and is ill-smelling and disagreeable. Poultry manure is also splendid, especially if mixed with dead leaves, litter, etc. Wood ashes and vegetable mold are excellent and your best plan will be to use all the poultry manure you have as well as the stable manure and to this add all the wood ashes on the place, several wagon loads of leaf mold from the wood lot, and all the rich black soil from the old cowyard. Then when you

plant the seeds use a liberal amount of commercial fertilizer and to force rapid, large growth, hoe a little nitrate of soda around the plants as they commence to bear. If you do this I'll wager you'll have crops that will surprise the old farmers."

"It looks to me as if I'd have plenty to keep me busy," laughed Tom. "How soon must I begin?"

"There's not much to be gained by starting too early on the fields," replied his cousin, "but you can plant radishes in the hot-beds in February and continued plantings every ten days will give a succession of crops until warm weather, after which it's not worth while to raise them. Other seeds which may be planted in the hot-beds late in February or early in March are early cabbage, cauliflower, celery, egg-plant, lettuce, cucumbers, tomatoes, and peppers. Some of these will be ready to set out in the field by warm weather, say about the time when the apple trees are in full bloom, and at this time early bush beans, carrots, early potatoes, beets, onions, parsnips, early turnips, peas, etc., may also be planted out of doors. In fact, if the spring is warm they may be safely sowed by the time the peach trees blossom. By the time the ground is well warmed by the sun and the apple tree blossoms have fallen you may transplant the tenderest things and

can sow pole beans, okra, squashes and similar varieties and by the time these are attended to the very tenderest seeds such as corn, lima beans, and melons may be sowed."

"Goodness! at that rate I'll have to begin planting next month," cried Tom.

"Yes, and you must also plan to prune and clean your fruit trees and grape vines, tap your maple trees and make your sugar; spring's the farmers' busy season and if I were in your place I'd make the work easier and simpler by drawing a plan of your market-garden, marking off the space to be devoted to each vegetable, the variety planted, the time of planting and the time the crops are harvested, as well as the crops destined to be planted on the same space later. This will serve as a guide in planting and harvesting this year and next season by referring to it you'll be able to learn which things succeeded best, the length of time they required to mature and the amount you obtained from each."

"That strikes me as a good scheme," admitted Tom. "I'll start on it at once. Let's go out and look over the ground now and measure it off and then I'll begin the plan, with your help."

"This field where you scattered the leaves is the best for your truck garden," remarked Ralph as

"It's too fine a tree to sacrifice"

they looked about. "But there's no use of wasting any space here for crops such as corn and potatoes; you can use the adjoining fields for those and there's no necessity of making a plan for them."

"Won't that big tree in the field interfere?" asked Tom. "We might cut it down and get a lot of wood from it."

"It's too fine a tree to sacrifice," replied Selwin, "and besides it's not fit for firewood. It's an elm and the wood is tough, fibrous and burns badly, but you'll be mighty grateful for its shade on many a hot summer's day and you've no idea how it will add to the landscape. It won't trouble your crops any for you've plenty of space and you'll not need to plant close to it. Never destroy a fine tree if you can avoid it, Tom. Bear in mind that such a tree as that elm can never be replaced in your lifetime. It may take but a short time to chop it down but it has required several hundred years for it to attain its present size."

CHAPTER VIII

BUSY DAYS

"This would be a good time to look over your farm tools and put them in order," remarked Ralph a little later. "Nothing like being prepared and ready, you know."

There were a number of implements stored in the barn and lumber-room and Tom and his cousin were occupied for an entire day in hauling these to the woodshed, cleaning them of accumulated dust, dirt and cobwebs and separating the good from the bad.

There were two plows, one of the conventional type, the other a fairly modern disk plow; a good steel-toothed harrow; two seeders; two cultivators; a manure spreader; a horse rake and a mowing machine, besides a number of hand-rakes, hoes, spades, forks and shovels.

Everything was rusty, neglected and in need of repairs and many of the implements seemed worthless and only fit for the scrap-heap.

"This big plow will be excellent for breaking the

ground and getting at the subsoil," remarked Ralph, "but it's a two-horse affair and you'll have to borrow a neighbor's horse in order to use it. It will pay to do this even if you have to hire a horse, however, for all your other work can be done with your own horse and the disk-plow won't reach deep enough to serve for the first plowing.

"The harrow needs some new teeth," he continued, "but that's easily fixed and for your purposes the hand-seeder will do as well as the horse-drawn affair which is badly broken. Both cultivators I think can be put into serviceable shape, although they look pretty bad, I'll admit. The manure spreader is useful but it's an obsolete form and is not worth repairing. The horse-rake is all right and I think the mowing machine will serve for one season if gone over and oiled and a few injured parts are replaced. The hoes and other hand tools are in fair shape and altogether I don't think you'll need to purchase anything but a new manure spreader, some scythes, a spraying apparatus and pruning tools. The manure spreader can be left for another year as you'll have to depend largely upon fertilizer this season and what manure you do use can be spread by hand."

"What's the spraying apparatus for?" asked Tom.

"To spray your trees, vines and plants with," replied Ralph. "In farming an ounce of prevention's worth tons of cure and by systematically spraying your plants with insecticides you'll prevent injurious insects from gaining a foothold. Too many farmers wait until the insects have made appreciable headway before taking steps to destroy them and their crops are greatly diminished in consequence. A spraying pump, or even a knapsack outfit, costs little money and saves its cost many times over in a season."

"What do you use in the apparatus?" queried Tom.

"Different solutions according to the insects to be destroyed and the plants affected," answered his cousin. "Practically all injurious insects may be divided into two general classes, sucking insects and biting insects. The first class includes such things as plantlice, scale insects, bugs, mites, etc., and the second class includes those creatures which actually devour the foliage itself, such as caterpillars, grasshoppers, various beetles, etc. The same insecticide which will kill one class of pest may not prove efficient against another. Most of the biting insects

may be destroyed by spraying the plants with some poison which the pests swallow with their food, whereas the sucking insects are destroyed by the insecticide coming into contact with the insects' bodies externally. Still other sprays are used to destroy fungus and mildew diseases. Kerosene and whale oil, sulphur-wash, lime, resin and soaps are all useful in killing the sucking insects; Paris green, arsenate of lead and other poisons are used for the biting species, and Bordeaux mixture, and various other compounds are employed for mildew, fungus, etc."

"I shouldn't think farmers could ever raise anything with so many enemies about," remarked Tom. "They must spend most of their time fighting insects."

"They don't spend half as much time that way as they should," commented Selwin. "If you keep insect pests in check there's little trouble; the greatest losses are due to neglecting the crops until the insects and diseases have gone beyond control."

Several days were devoted to taking apart, cleaning, oiling and repairing the various tools and machines and when at last the work was accomplished the rejuvenated implements appeared like new in their fresh coats of paint and with steel parts bright and polished.

The days were now lengthening, bare patches of ground showed here and there through the snow and the trout brook broke through its icy covering and sparkled gayly in the sunshine.

On every hand were evidences that the winter had lost its grip and that spring was approaching.

The hens had almost ceased laying but Kitty's flowers, potted plants and budded bulbs more than made up for the loss from the eggs and she could readily have disposed of ten times the number of flowers that she could furnish.

"Next year you can grow flowers on a large scale," said Ralph. "We can build a hot-bed greenhouse which will serve your purpose just as well as an expensive steam-heated affair and by starting in early you can have an abundance of flowers all winter."

"I expect the sap's commenced to run and we'd better start our sugar-making," remarked Ralph one morning. "Suppose we go over to your woods and tap the trees?"

Accordingly he and Tom set forth, armed with buckets and an auger, for the maple grove beyond the brook. At the edge of the stream Selwin cut several sections of elder stems and Tom asked what they were for.

"We'll use them for troughs," replied his cousin. "Elder's hollow and by splitting these pieces and sharpening one end we can drive them into the holes in the maples and save the trouble of whittling out wooden troughs. We're not going to gather such a large amount of sap that we'll need anything better to-day and if we find the sap is running well we can make proper troughs, bring over a lot of pails and a big kettle and boil down the sap in the woods. There's still enough snow over here to use the sled and we'll make a regular picnic of it."

When they reached the first of the trees holes were bored through the bark and even before the auger was withdrawn the sap commenced to trickle down the trunk. A piece of the elder was driven into the hole, a bucket placed beneath and Tom delightedly watched the sap drip steadily into the pail.

Both buckets were filled with sap, the holes were then plugged up and Tom and Ralph returned to the farm. Here the sap was placed in a kettle on the stove and that evening home-made maple syrup was voted the most delicious thing they had ever tasted.

The daily picnics in the sugar grove were good fun and at the end of the week nearly sixty pounds

of sugar had been gathered and safely stored in the cellar of the farm house.

"I'm mighty glad we saved those trees," remarked Tom. "It's fine to get all this splendid sugar and syrup right from trees without any trouble about planting and cultivating and all that sort of thing."

"Yes," replied Ralph, "and the best of it is that with every season the amount you obtain will increase. A good maple grove is a never-ending source of income. You're too far south to get the best results from the trees but wherever sugar maples grow sap and sugar may be obtained. A great many people think that maple sugar can be made only in the most northern states and don't bother to tap their trees and I doubt if any of your neighbors ever have sugar or syrup from their own farms."

Tom had already planted radishes in the hotbeds and he was highly elated when the first tiny, green leaves of the seedlings appeared above the surface of the ground. Early in March he pulled up some of the crisp, pink roots and the owners of Ridgelea Farm partook of their first crop.

"O, let's take some over to Aunt Mandy," cried Kitty. "She and Grand'ther Joe will be *so* surprised."

"Bully," agreed Tom. "I'll bet they never saw native radishes in March before and I'll ask him about lending his horse to plow my field at the same time."

"Where in Sam Hill did ye git *them?*" asked the old man when the radishes were presented.

"Out of our own garden," cried Kitty gayly. "They're the first of our crops."

"Well, I'll be durned," was all Gran'ther Joe could say.

"Sure I'll lend ye old Nell to hitch up ter plow with," he replied to Tom's request. "I allers borrows a hoss to help me an' I'll be right glad ter 'commerdate you folks."

"I'll let you have our horse when you want it," said Tom. "We're the nearest and it's time we did something to return your favors."

It was some time before their visit to Gran'ther Joe that Ralph announced that it would be a good plan to prune the grape vines and fruit trees.

"If we wait longer we'll lose too much sap and the buds will be injured," he remarked. "But it's almost as great a mistake to prune too early. Many grape growers start pruning in January, but February is the most suitable time and while we're a little late the sap has not yet commenced to run too

much. In very cold weather the vines are frozen and brittle and great skill is required in order to know which portions to cut away and which to leave. Pruning done too late leaves the vines to bleed and thus lose a great deal of vitality. If pruned after the buds have begun to swell and while the nights are still cold the wounds rapidly heal and little sap is lost. Your vines have been neglected so long that you can scarcely expect very good results this season and most of the strength of the vines will be devoted to forming new wood."

"How can you tell what to cut and what to leave?" asked Tom.

"An expert can determine by the appearance of the bark," replied his cousin. "But it's easier to judge by the buds, which only appear on live wood."

They had now reached the arbors and Ralph pointed out the swelling buds and explained that the fruit is always produced on the new sprouts formed each season and that these grow from the wood of the previous year.

"While every bud may grow," he said, "yet only a portion of them will bear grapes and a professional grape-grower can tell by their appearance which will and which will not bear. As a general thing the strongest, largest buds will be the most

productive and in order to cause these to produce the finest and largest bunches of fruit it is necessary to remove all superfluous buds. A shoot always bears its fruit near the base and the outer portion then develops into a leaf-covered vine. Two clusters of grapes to a shoot are enough and the number of shoot-buds to be left on a vine must be gauged by the health, strength and size of the plant."

"Well, I think there's a lot of science even in pruning grape vines," remarked Tom. "I always thought all one had to do was to cut off a lot of the stems."

"A good many people have that same idea," replied his cousin, "and they snip off the shoots here and there without knowing what they're doing or what the pruning is for."

As he spoke he was taking the vines down from their supports while Tom, at his direction, untangled the branches.

"Be careful not to break or bruise the buds," cautioned Ralph. "It's unfortunate that we are compelled to tear down the vines, but they're so tangled and clogged with dead shoots that it's impossible to prune them otherwise."

He then proceeded to cut away all but four or five of the best branches on each vine and pruned these back until but a dozen or so buds were left

on each branch, with the several stalks radiating from the upper portion of the sturdy trunk.

The old netting support was then taken down and with Tom's help stout wires were stretched between the trellis posts with the upper wire about six feet above the ground.

The branches were then carefully extended along these wires and tied in position.

"That looks like a pretty bare sort of arbor," remarked Tom as they tied the branches to the wires. "I shouldn't think we'd have any vines to give shade."

"If you want shade you should carry the main stalks over the trellis and trim them so as to leave lateral shoots at various heights, but the method I've followed will make it much easier to pick the fruit and for shade you can plant some quick-growing, ornamental vines, such as gourds, morning glories, etc.," explained Ralph. "Your grape crop," he continued, "may not amount to much this year but the vines are fine, large specimens and with a little care and pruning and with some rich fertilizer about the roots they'll add considerably to your income in a few years."

The next day the orchard was visited and the trees inspected.

"There are a lot of good trees here," declared Selwin, "but they all need pruning and cleaning and many of the trees are so far gone as to be worthless. They'll provide quite a little firewood and the orchard will be the better by their removal."

To prune and clean up the orchard was no small job and nearly three weeks passed before Ralph was satisfied. Under his cousin's instruction Tom had already learned to handle an axe very well and he now had a chance to show his skill in cutting down a number of trees. Tom found apple and pear wood tough and hard but with axe and saw the two set to work and at the end of a week the worthless trees had been felled and hauled to the woodpile by the horse and the branches and twigs had been gathered up and burned.

"There's no use in saving them," remarked Ralph, "they're covered with insects and if they're left until warm weather the pests will spread to the other trees."

Ladders were then brought and Ralph and Tom climbed about in the trees, sawing, chopping and cutting until, as Tom expressed it, the trees looked as if a "hurricane had passed."

The amount of dead and decaying limbs which Selwin said should be removed was astonishing and formed a huge pile which was promptly burned.

Even then the work was not over for Ralph pointed out the innumerable scale insects, caterpillar-nests, cocoons and eggs which were hidden in crevices of the bark, in tiny hollows and in every available retreat.

"If you expect any results from these poor, neglected trees, you'll have to destroy all of these pests possible," he declared, "and it's easier to do it now than later."

"All right," agreed Tom. "I suppose it's all a part of modern scientific farming and I don't mind the work."

"That's the proper spirit," said Ralph. "I don't suppose this orchard has produced anything but a few sour, cider apples and knotty, deformed pears for years, and I've no doubt your farmer neighbors will think it time and labor wasted to try to do anything with the trees, but the 'proof of the pudding's in the eating' as the old saying is and we'll wait until next fall before we pass judgment. Most of the trees are grafted and there's no reason why they shouldn't bear good fruit."

"I was reading about grafting in one of the pamphlets," remarked Tom. "It says a tree can be grafted to bear several different kinds of fruit at once."

"That's perfectly true," replied his cousin. "Next winter we'll try some experiments in grafting if you wish; it's too late for this season."

"Is it hard to graft?" asked Tom.

"It's quite easy if a little care is taken," replied Ralph. "There are numerous methods, such as whip-grafting, cleft-grafting, bridge-grafting, saddle-grafting, splice-grafting, tongue-grafting, etc., and in addition there's a variety of grafting known as 'budding.' Any number of grafts or buds may be made on one tree and each graft, as it grows out, will bear the fruit or flower peculiar to the tree from which the graft was obtained. I don't mean that a cherry can be grafted on an apple or a peach on a cherry however. Grafting or budding can only be done upon trees of the same kind as the graft, or upon closely related kinds. Pears may be grafted on quince and almonds on peach or plum, or *vice versa,* but it would be impossible to graft a lemon on a cherry or a plum on an apple."

Tom thought it would be great fun to have apple trees bearing a dozen or more varieties of fruit and declared that next winter he'd spend a lot of time at the work.

In the meantime he and Ralph worked industriously at the trees, scraping off the loose bark,

destroying cocoons and caterpillar-nests and digging out boring beetles from their retreats in the wood. Then all the trees were given a good coat of whitewash and Selwin announced that nothing more could be done.

"Whew! I've never worked so hard in my life," exclaimed Tom when the orchard was finally finished.

"Remember what Uncle Ab said about hard work," laughed his sister. "I haven't heard you complain about indigestion or headaches this winter, Tom, and I do believe you've gained weight."

"Oh, I'm not complaining, sis," replied Tom. "I've never minded cold weather less and I've felt fine. I know I've gained in health and weight and you have too."

"Nothing like out-door work," commented Ralph, "but there's no use in overdoing and working so much you grow tired of farming before you've really begun. 'All work and no play makes Jack a dull boy,' you know. What do you say to taking a day or two off and trying our luck for trout, Tom?"

"Hurrah! That will be splendid. I'd almost forgotten about the brook."

The next day was spent with rod and line at the

brook and the two fishermen returned late in the afternoon with fine strings of trout.

"I believe Mr. Grayson would love some of these trout," remarked Kitty. "Can't we take some in to him?"

"Of course we can, Kit," replied Tom. "I'll go into town with you to-morrow and give him the trout and I'll buy the farm tools I need and my seeds and fertilizer at the same time. You'll come along to help me select the things, won't you, Ralph?"

Mr. Grayson was greatly pleased with the trout.

"You *are* in luck, Tom, to have a trout brook on your own land," he declared. "If you care to lease out the privilege of fishing there on certain days I can arrange with some friends to pay you well for it."

"You're welcome to come out there and fish whenever you wish," replied Tom. "We'd be only too glad to have you."

"I'll certainly accept your invitation," replied Grayson, "but it's not right that you should give up your brook without remuneration. The friends to whom I refer are members of a fishing club and they're paying for the same privilege on other prop-

erties. I'd like to see you receive some of the benefits."

"Well, if it's a club and they're doing that sort of thing right along I'd just as leave rent the rights to the brook on some days," said Tom, "but remember you're a privileged character, Mr. Grayson, and can come out and enjoy yourself whenever you wish."

"Very well, my boy, I'll pay you a visit very soon," agreed Grayson. "I'll enjoy seeing your farm, even if I don't have any luck with the trout."

"Ready for some more work?" asked Ralph the next day. "The blackberry and raspberry vines are in need of attention and then you can commence plowing. The frost's nearly out of the earth and the sooner the ground's broken the better."

To Tom the tangled, thorny, litter-filled mass of vines appeared hopeless but his cousin had a different opinion.

"They're badly neglected," he remarked, "but they're strong, healthy plants and only require proper pruning, care and cultivation to produce splendid crops of berries."

"All these vines," he continued, "produce their fruits on shoots or canes sent up the preceding year and after the fruit is borne these canes die down.

It's this accumulation of dead stalks which makes the vines appear like a jungle or a brush-pile."

"Then I suppose the proper idea is to cut away all the dead stalks and prune the new ones that grow out?" said Tom.

"Precisely," replied his cousin. "I see you're learning the principles of pruning already."

"If the bushes are cared for each autumn it's comparatively easy to keep the vines clear and free from trash," he added, "but here we've the accumulated rubbish of years. Each year the old canes should be removed as soon as the berries are over and the new shoots, which will bear the flowers and fruit the next year, should be cut back."

"Are blackberries and raspberries treated the same way?" asked Tom as he worked industriously among the bushes.

"In a general way, yes," replied Ralph. "Most of the black raspberries throw out lateral branches the first season and these should be cut back when two or three feet in length to force the growth of the side branches which will bear the following year. As soon as warm weather arrives these new shoots may be cut back to a foot or less in length, thus keeping the bushes compact and insuring more and better fruit. Some of the red raspberries have a

similar habit while others, as well as blackberries, seldom branch. With the former the pruning should be done as for the black varieties whereas the non-branching kinds must be treated differently. If these are cut back in early summer the next season's crop will be small, for a large portion of the strength of the plants will be exhausted in making new wood. It is better to cut away all surplus canes after the vines have stopped bearing in the autumn. Four to six shoots are sufficient for each plant when the bushes grow in hills and if planted in rows three shoots to a foot are enough. Such treatment insures large, strong stems which will not bend or break with the weight of leaves and berries, but after a heavy rain they will often droop and it's a good plan to furnish a support of some sort for all berry bushes."

"These don't seem to have been supported," remarked Tom. "They're mostly flat on the ground."

"In a way that's been fortunate," said Ralph. "It's served to protect them from injury by frost and ice and many growers purposely lay the bushes flat on the earth and protect them with leaves or straw over winter. Moreover a number of the side branches have 'heeled in' of their own accord and have taken root as you see." As he spoke Ralph

held up a raspberry branch with a bunch of rootlets clinging to it.

"Isn't that funny," said Tom as he examined the stalk. "I didn't know a branch would take root that way."

"It's one of the easiest methods of propagating raspberry bushes," replied his cousin. "If you cut these sprouting canes from the bushes and set them out, each one will form a new bush and you can add greatly to the number of your plants in this way. Red raspberries also send out underground shoots from which so-called 'suckers' sprout up and these suckers, with a portion of the root, may be dug up and transplanted."

"I suppose you have to graft them the same as other fruits to get good results," remarked Tom.

"No," replied Ralph, "when plants are propagated from roots or cuttings they bear the same fruit as the parent, save in varieties which are grafted. Thus suckers, cuttings or roots from below the graft on an apple, rose or other plant will produce the ungrafted, inferior fruit of the parent stock whereas a cutting, bud or slip from above the graft will produce the same fruit as that borne by the grafted portion. Seedlings from a grafted plant will not 'come true' however but may be better or

worse than either the graft or the parent stock. In the case of the raspberries and blackberries however, suckers, 'heeled in' plants or cuttings of any sort will produce the same fruit as the bush from which they were taken as these vines are never grafted."

At last the bushes were all pruned and cleared, the dead trash removed, the rooted branches and suckers replanted and the close cropped canes were secured to wires stretched between stakes.

"Well, I'd never have believed that tangle of old vines could have been made so neat and orderly," remarked Tom as they picked up their tools and started for the house. "It certainly has been improved."

They found Kitty busily at work raking and clearing up the land before the house and she pointed with delight to some tender green sprouts pushing through the soil she had uncovered by raking away the dead leaves.

"Doesn't that look springlike?" she exclaimed. "And do you know, Cousin Ralph, I saw a robin to-day?"

"That's a good sign," said Selwin. "I've no doubt we'll have fairly warm weather from now on but you cannot place too much reliance upon either

robins or bluebirds as heralds of spring. Many of these birds frequently stay with us all winter but keep out of sight in their winter retreats in the woods and evergreen groves. The best sign of settled spring weather is the swallow. One swallow doesn't make a summer perhaps, but after the swallows arrive there's little fear of cold weather."

"Well, I'd like a lot of swallows—of food," remarked Tom; "I'm as hungry as a bear."

CHAPTER IX

FARMING IN EARNEST

The willows by the brook were gray with downy "pussies"; bluebirds twittered as they flitted from tree to tree and here and there golden dandelions glowed in sheltered, sunny spots.

For days Ralph and Tom had labored in the fields, taking turns at driving and guiding the big plow, until arms ached and backs seemed on the point of breaking. Then came the easier work with the disk-plows, followed by hour after hour with the harrow until Tom thought the work would never end.

"Goodness! I never thought ten acres was so much land," he exclaimed as he stopped to rest and kicked the clinging, damp soil from his boots. "How many more times have we got to go over this field anyway?"

"It's nearly done," replied his cousin. "But you're lucky to have such clear soil. Think of the work the old settlers had in breaking raw land, or in plowing some of the stony New England farms.

The brook broke through its icy covering [Page 136]

Ralph and Tom had labored in the fields

How would you like to plow and harrow a farm of several hundred acres?''

''None of it for me,'' declared Tom. ''This is all I want to handle. But they never plowed those big farms by hand, did they?''

''Certainly they did,'' said Ralph. ''Although nowadays motors, traction engines and steam plows have revolutionized the big wheat and corn farms of the west and hand plowing's a thing of the past.''

''Well, I'm glad we didn't undertake to plant any more than this,'' said Tom as he picked up the reins and started across the field. ''I'd have been discouraged before I began to plant.''

''Spring is here,'' cried Kitty as Tom and Ralph drove in from the fields one afternoon. ''I saw three swallows to-day.''

''And the field's all ready to plant,'' announced Tom. ''To-morrow we begin sowing the seeds and then for farming in earnest.''

Five acres of the plowed land was reserved for potatoes, two acres for corn and the remainder for the market garden.

''Potatoes are one of the most profitable crops you can raise,'' Ralph said to Tom as they were planning for the garden. ''There is always a demand for them and the only reason that many farm-

ers consider them unprofitable is because they don't get the best varieties, do not attend to the minute details of cultivation and make the mistake of saving their own seed."

"What's the reason their own seed isn't good?" asked Tom.

"To get the best results from any plant the seeds sown must be of the very highest grade and the best grade seed is not always grown where the crops of the same plants are most profitable," replied Selwin. "Thus the best potatoes for planting come from Maine, New Hampshire, Vermont and Canada and even the Bermuda potatoes are grown from northern seed. Moreover, seed saved from any plant by farmers is seldom pure. Where a number of varieties are grown near together it's practically impossible to prevent them from becoming mixed and producing mongrel seeds. The professional seed growers devote large areas to each separate variety and moreover they secure their stock of seeds from widely separated districts, each famous for some particular plant, vegetable or flower seed. If you want the best results always purchase your seed supplies from reliable firms and don't try to raise your own."

"How many potatoes should I get from the five

acres?" asked Tom. "It looks like a lot of land to me."

"Most farmers are content with from 100 to 150 bushels to the acre, and not very good potatoes at that," said Ralph, "but as many as 500 bushels may be produced on an acre. Under proper conditions and with good care you ought to have fully 1,000 bushels from your field. If you plant several varieties, early, late and medium, you can command better prices than if all are of one kind, and as the tubers are dug you can plant spinach, celery and other vegetables in the land left vacant. By the time your other seeds are all planted it will be late enough to plant the potatoes and you can gain considerable time on the earliest varieties by sprouting them before planting. If this is done you should have potatoes on the market fully two weeks before any planted out of doors in the ordinary way and you can obtain fancy prices in consequence. To sprout the potatoes, select the medium-sized seed potatoes and place the sets in hotbeds for a couple of weeks before it's time to plant. If they are then lifted out and set on fresh horse manure the heat will induce very rapid growth. Another method is to set the tubers close together in open trays in the fall. Keep them where it's fairly cool and there's

plenty of air and light, and short, firm sprouts will be formed before spring. Either method requires some care and trouble but the extra time gained and the prices obtained make it worth while."

"Isn't there any way to hurry up other things also?" asked Tom.

"Yes," reflected his cousin. "Many of the harder-shelled seeds, such as beets, carrots, salsify, parsnip, etc., may be hastened by steeping them in hot water, care being taken not to have the water hot enough to injure them. Usually if they are soaked for twenty-four hours it's enough and you can gain quite a little time by the process. Many things may also be started early by the use of 'forcing hills.' These are in reality individual cold-frames made where the plants are to remain permanently. Such plants as asparagus, rhubarb, melons, squashes, cucumbers, etc., do very well indeed by the use of forcing hills and may be advanced from two to four weeks in this way. It's particularly valuable for squashes and cucumbers, which bring high prices early in the season, but are hardly worth raising later on. The best way of making forcing hills is to have boxes in sections which may be packed away when not in use. These are placed about the plants to be forced, a pane of glass

is placed over each and if the weather is very cold a light covering of straw or leaves may be placed around the boxes. Another way is to make a mold in the earth by piling up the soil around a box and then withdrawing the box and covering the hollow with glass. Still another method is to knock the bottoms out of flower pots, set these over the seeds to be forced and cover the ends with glass. The two latter methods are the best for your purpose and I'd advise you to start most of your cucumbers and squashes in this way. Your rhubarb back of the barn is well started but if you place a removable cold-frame over it you'll get quick results. The same is true of asparagus, although the old asparagus bed here is so neglected and run down you'll scarcely be able to sell anything from it this year."

With Ralph's help planting proceeded rapidly and peas, parsnips, radishes, salsify, turnips, carrots, etc., were sown in rapid succession. Squashes, melons and cucumbers were planted with forcing hills about them for the earliest crops. The cabbage and cauliflower plants were removed from the hotbeds and set in the field. Bush beans, celery, lettuce and the early potatoes were planted, followed by the egg plants, peppers and tomato plants from the hotbeds, after which pole beans, wax beans, okra, late

lettuce and similar things were attended to. As the last of the lima beans and corn were covered Tom threw himself on the tender green grass beneath the big elm and exclaimed: "Well, that's done at any rate. Now we can loaf a while."

Selwin laughed. "Don't fool yourself, my boy," he remarked. "Your planting's finished to be sure, but you've no time to loaf, although you can have a change of work for a time. Don't forget your plan to rig up a pump and water tank. Then there's the poultry to look after, the flower boxes to be filled and delivered, and the young plants to be cultivated and thinned. And by the way, I notice you're already glad of the shade of this tree, even in the spring sunshine and before the leaves are out."

"You're a long-headed chap, Ralph," laughed Tom. "And I'm glad you made me save this tree, but my word, you *are* a driver and now you put me in mind of it there are still other things to be done. How about the automobile I was going to buy and the den of foxes Gran'ther Joe was to show me? Golly, we've got to hustle. I'm going over to see about those foxes this afternoon and I've made up my mind we simply must have a car. The old horse

Many farmers use automobiles as tractors

may be all right for hauling wood and plowing but he's too slow for going back and forth to town."

"It *will* be economy to have a machine," agreed his cousin. "Time's money on a farm and as for the foxes it's about time to dig them out if we're to do it at all."

"You can't guess what a surprise I have for you," cried Kitty as she met them near the barn. "Hurry up, both of you," and she led the way towards the poultry yard. "Just peek in there," she whispered as they reached the fox run.

Tom and Ralph "peeked in" and Tom involuntarily gave an exclamation of delighted surprise. In a sunny corner of the run sat the black fox and near him his red mate lay resting upon her side, while about them played and romped six of the cutest, fluffiest bundles of brown fur that Tom had ever seen.

At the sound of his voice, however, the mother leaped to her feet and like a flash the whole happy family disappeared in the old barrel which Tom had provided for a shelter.

"Aren't they just lovely?" exclaimed Kitty as the three walked away. "I've been watching them for an hour and they play just like kittens."

"They're certainly pretty," agreed Tom. "I wonder how many of them will be blacks?"

"We're going over to Gran'ther Joe's to ask him to show us that fox den of his," announced Tom a little later. "If we get another family we'll have quite a fox farm."

"You'll have all you can attend to between the foxes and chickens and the horse," laughed Ralph. "How about the cow and pigs and other live stock you talked about?"

"I guess we'll have to let them go for this season, or hire a man," admitted Tom. "I didn't realize there was so much to do."

"Oh, do let's have a cow," pleaded Kitty. "The milk and cream and butter will be so good. I'll attend to the chickens and foxes and the cow if you like. I've plenty of time, now my winter flowers are all over and my garden's planted."

"You can look after the chickens and foxes if you wish, Kit," replied Tom, "but I draw the line at the rest. I'm going to hire a man anyway, to help with the work as soon as the crops begin to come in, and I'll ask Gran'ther Joe about a cow to-day."

Gran'ther Joe had just finished harrowing his

fields when the two reached his house and he gladly agreed to lead them to the fox den.

" 'Spect ye must be through harrerin' or ye wouldn't be down here," he remarked as they tramped through the fields towards the hills beyond. "Must 'a' worked right smart to 'a' got it all done so 'arly."

"Oh, I've planted all my things," said Tom. "We finished harrowing long ago."

The old farmer stopped short and looked fixedly at Tom. "Now, looka here," he demanded, "ye don't 'spect me ter b'leeve that, do ye?"

"It's certainly true," Ralph assured him. "We've planted our ten acres as Tom says. He's pushing things for early crops."

"Wall ef thet don't beat all," exclaimed the farmer.

The fox den proved to be a hole in the southern side of a steep hill and from the fresh earth outside Selwin declared it must be occupied and he and Tom commenced digging away with shovel and pick and even Gran'ther Joe took hold and "spelled" them several times.

Deeper and deeper they dug and Ralph announced that they must have nearly reached the nest when there was a sudden commotion in the earth and a

big, reddish-gray animal burst through the soil and scampered off into the nearby brush. Tom gave a startled yell as the creature dodged between his legs; Ralph made a frantic grab at it and fell face down on a pile of earth, and old Joe rolled head over heels for several feet in his unsuccessful attempts to reach the beast.

"Consarn the critter!" exclaimed the old man as he rose to his feet.

"My, but wasn't he a big fellow," cried Tom. "It's too bad we didn't get him."

His cousin burst out laughing. "You wouldn't make much raising foxes of that sort, Tom," he exclaimed.

"Wall, the joke's on me I calcerlate, but jist the same thet there was the whoppinest old woodchuck I ever sot *my* eyes on," said Gran'ther Joe.

When Ralph and Tom returned to the farm they found Mr. Grayson, who had spent the afternoon fishing in the brook.

"You see I accepted your invitation," he said as he greeted Tom and Ralph. "And I've had fine luck too. Kitty's been showing me about. I've seen the foxes and the poultry and everything else and I think you've done wonders. It's a lovely situation and I wouldn't mind living here myself. If you ever

want to take 'city folks' to board don't fail to let me know."

"We'd be only too glad to have you come out and stay with us," declared Tom, "if we had the room. Perhaps next year or the year after we'll add on to the house and take boarders, but *do* come out to see us and bring Mrs. Grayson, whenever you wish. Did you try our maple sugar?"

"I certainly did," replied Mr. Grayson. "And it's the first *real* maple sugar I've tasted in many a year. Kitty's given me a big can of it, but I'm sure she's robbed her own larder."

"Not a bit of it!" exclaimed Tom. "We've plenty and to spare. By the way, how soon do you want your plant-boxes delivered?"

"Any time that's convenient," replied Mr. Grayson. "Your sister showed me those rustic boxes you made and if I may I'd like to have my order changed to include new boxes of that sort instead of having my old ones refilled."

"But where are the foxes you were to find?" asked Kitty.

Tom and Ralph then told of their experience with the woodchuck and both Kitty and Mr. Grayson laughed heartily at their story.

"I haven't enjoyed myself so much in years,"

declared Mr. Grayson as he rose to take his leave. "It makes me feel quite like a boy again; nothing like the simple life after all."

"Especially when one can have all the modern conveniences," laughed Tom.

"True enough," agreed the other. "With rural mail delivery, telephones, trolley cars, electricity and similar things farming to-day isn't much as it was when I was a youngster. I suppose you'll have your own automobile soon?"

"It's the next thing on the list," replied Tom. "I'm going to get one this week."

"I'll have to ask a lot of advice about getting the car," Tom remarked that evening. "I don't know anything about the various makes, but I suppose one of the light, cheap cars will be the only thing we can afford."

"The cheap cars are all very well for town use or for ordinary running about," said his cousin. "But for farm work you want a strong, powerful car that will stand any amount of use and hard work. Style, beauty or model is of no importance. It's far wiser to get a really good second-hand car of some standard make than to buy a new cheap car or a new car made by some unknown or uncertain firm."

"How much should I pay for such a machine?"

asked Tom. "I suppose even a second-hand car will cost a great deal."

"Cars are rather more expensive in the spring than in the autumn," replied Ralph, "but there should be no difficulty in finding a good car for $300, or less. The price depends largely upon the make and model of the car and its condition; the original cost of the machines when new has little influence upon the prices asked for used cars."

"Why, that's cheaper than a cycle-car," exclaimed Tom. "I should think everyone would buy second-hand cars."

"Many people look at automobiles in the same light as clothes," said his cousin. "Appearance and style are the only features that appeal to them and they'll pay several thousand dollars for a car of the latest design and turn in their old car for a mere song when as likely as not the old car is mechanically superior, more reliable and more economical than the new one."

"I suppose economy *is* an important matter," remarked Tom. "How much does it cost to keep a car?"

"That depends upon the car as well as upon the care you give it, the use you put it to and how much repair and upkeep work you can do yourself. The

consumption of gasolene will vary from 20 or 30 miles to the gallon to 3 or 4 miles in different makes of cars. You must bear in mind, however, that the records for economy quoted by the manufacturers are made under the most favorable conditions and that the user of a car can seldom if ever equal them. As a rule, if you obtain from 12 to 15 miles to the gallon of gasolene you are doing very well. On hilly, sandy or bad roads the consumption is greater than on smooth, level roads. The oil used amounts to very little and 300 to 500 miles to a gallon of oil is common. Tires are the greatest expense in connection with a car and for that reason you should use the lightest car possible which will stand up under the work demanded of it. Many tires are guaranteed for a certain number of miles—usually 3,500 to 5,000—but the makers charge enough for such tires to cover the risk of replacement and more; in other words you are paying a premium, not only on the insurance of our own tires, but on those of others as well. Many of the cheaper tires will give just as good service even though they carry no guarantee and oftentimes factory 'seconds' are just as serviceable as any. As in every other matter relating to automobiles the success you have with tires is largely a matter of personal care, but there's

considerable chance in the tire proposition also. I've sometimes had a tire stand up for nearly ten thousand miles and another of the same make break down in less than 500 miles. A car such as you'd select would carry tires of 32x3½ inch size probably and good tires of that size may be purchased for $10.00 to $15.00 each for the casings. The tubes cost from $3.00 up but as the tubes may be repaired over and over again their aggregate cost is not great. The expense of repairs and replacements will depend entirely upon the care you give the car, your own skill in mastering the mechanical end of it and the use you give it. A man may neglect and bang a car about so much that his repair bill will amount to several hundred dollars yearly, while another owner of the same sort of car might take such excellent care of it and use it so well that his repairs wouldn't cost twenty-five dollars annually."

"I guess I'd better learn all about the car as soon as I get it," said Tom. "Is it difficult to master such matters?"

"No, a four-cylinder car is not very complicated," replied Ralph, "unless it's fitted with all the latest improvements such as electric lights, self-starters, complicated ignition systems, etc. You'll find no trouble in learning all about your car in a short

time and there's no better way of getting the most service from a car and saving expenses than to become thoroughly familiar with every part of it and to keep each and every portion in good condition and constantly 'tuned up' as they say."

"I wouldn't know a good car from a bad one," remarked Tom. "That's why I'd be afraid to buy a second-hand car. But I suppose you'll go to town with me and help me pick one out?"

"I'll be glad to," replied his cousin. "I know several reliable dealers, but no matter how reliable a dealer is one must be familiar with the various machines and must use care in buying used automobiles. A car may look all right and a demonstration may prove that it seemingly runs well, and yet injured, weak, mended or even broken or cracked parts may exist, which are hidden from view by paint, or are out of sight to the casual observer."

"I never knew there were so many kinds of cars," said Tom after having looked over the stock of several dealers.

"And I never expected to take so many rides in one day," laughed Kitty. "We've done nothing but ride in automobiles all the forenoon."

"I don't see how we're ever going to decide which is the best car to buy," Tom continued. "Every

one we try seems to have something in its favor."

"It's a process of elimination," said Selwin. "By crossing off those we're sure we don't want we can narrow down the list to a few and then 'twill be comparatively simple to select the one which is the best bargain."

At last the choice was between two cars and when the owner of one agreed to throw in an extra tire as an inducement his offer was accepted.

"Now let's get that pump you mentioned," suggested Tom. "And on the way home we'll go around by the grist mill and see about the tank. If we're to have a supply of water we might as well get it ready before the crops take up all our time."

"I'm glad to see you're taking the initiative," said Ralph, "and you're perfectly right in your ideas. There's no time like the present to fix up any odds and ends of work you have in mind, for in a week or two you'll have your attention fully occupied with your garden. Do you think you'll be able to drive the car home?"

"Well, I've driven your car, you know, and I'm pretty confident I can handle this one," replied Tom. "But if you don't mind I'd rather have you take charge while we're in town. I might get into trouble

with all the traffic. After we get out on the country roads I'll try my hand."

"That's wise," agreed Ralph. "Too many men feel an over-confidence in their skill and accidents result. Handling a car in the congested streets of a city is very different from piloting it along an open road."

The pump was purchased very soon and the party headed towards home. Tom had no trouble in driving after they reached open country and Ralph instructed and helped him as they sped along. They turned off and visited the grist-mill at the cross-roads and after a little bargaining secured the tank and Tom agreed to call for it with his horse and wagon.

"You'll have to build a garage or shed for your car some day," remarked Selwin. "It's all very well to store it in the barn at present for want of a better place, but in case of fire in the barn you might lose the car and in case of fire about the car you'd likely lose the barn and hay. Next fall you can build a good fireproof, concrete garage, but temporarily a mere shed will do very well. Even an old wagon-cover or tent would be enough during the summer."

"We might as well put up something right away,"

replied Tom, "and make it big enough for two cars. You'll bring yours out here of course as soon as the painting is finished."

For several days Tom and Ralph were fully occupied in connecting the rotary pump with the motor, fitting pipes from the pump to the well and erecting a rough but strong platform about six feet in height upon which the tank was placed.

"While we're working at it we might as well provide a separate outlet and a shut-off cock to the pump," suggested Ralph. "If the place ever catches fire you can start the motor and by connecting a hose to the pipe you'll be able to throw a stream to the top of the house or barn. Moreover you can use the hose for washing the cars or wagon and for watering Kitty's plants in dry weather."

At last the connections were all made and the motor started and all three watched the water pour from the pipe into the big tank as the pump sucked it steadily from the well.

"Now you can draw water right at your door," remarked Ralph as he shut off the power when the tank was filled. "You'll find it a great convenience and by carrying a pipe underground to the barn you can water your stock with ease. Let's connect

the hose and see how far we can throw a stream with our fire engine."

"Isn't that great?" exclaimed Tom as the pump was again started and the slender stream of water hissed from the hose nozzle to the roof of the house. "No danger of a fire getting much headway as long as this pump's going."

"Let's hope we never have to use it," cried Kitty. "I dread fire and the motor might fail or the well might run dry at just the wrong time."

"I don't expect we ever will need it," said his cousin, "but it will give a feeling of greater security to have it ready."

Tom found the auto a great time-saver in going to town and after a few trips he had so greatly improved in his driving that he no longer feared to run anywhere in the city alone.

The first time he saw the car old Gran'ther Joe was inclined to be skeptical.

"So ye've got one o' them there contraptions," he remarked as Tom and Kitty proudly exhibited the car. "I 'spect ye think it's better'n the old hoss, eh? I've druv critters fer nigh onto sixty year an' I'd ruther have old Nell than all them onery things as was ever built."

"O, we still use the horse," cried Kitty. "For

farm work and plowing and lots of other things he's much better than the car, but the machine's so much quicker for going back and forth to town. Besides, if we want it in a hurry we don't have to stop and harness up and curry it and get it ready the way we have to with a horse."

"Yes, and when we come home we don't have to unhitch it and bed it down and water it and see that it's tied so it can't get cast and all that nuisance," added Tom.

"And most important of all, it's not eating its head off when not in use," commented Ralph. "That's the biggest advantage a car has over a horse."

"Won't you take a ride with us?" begged Kitty. "I don't believe you've ever ridden in a car yet."

"Wall, I can't say as how I hev," admitted the old man. "Mandy's that skeert of 'em thet she'd have a conniption fit ef she saw me a ridin' in one, but she's gone over to Grant's terday an' I jest b'leeve I *will* take a ride jest ter see what the things is like."

"Now don't ye go a-puttin' on speed, son," he cautioned, as he climbed into the car. "Time wuz when I wuz as lively as ther next one. Shucks, when old Nell and me was youngsters we didn't let

no team pass *us* on the road, no, *sir.*" The farmer chuckled at the memories of his youth.

"You needn't worry, Gran'ther," Kitty reassured him. "I won't let Tom drive fast and besides he's not had practice enough to drive very rapidly and he's very careful."

For a few moments the old man sat silent as the car rolled smoothly along but gradually a smile overspread his wrinkled face and as he glanced at trees and fences flying past he exclaimed:

"Wall, ef this *ain't* travelin'. Why here we be mos' down ter Wood's hill a'ready. Better turn about, son; ye don't expect ter git this wagon over thet hill without er hoss, do ye?"

"Why of course I do," laughed Tom. "Wood's hill isn't anything. We've been over it half a dozen times."

"Jumpin' Jehoshaphat!" cried Gran'ther Joe as the machine continued steadily up the grade. "Ef this here contraption ain't *a-trottin'* up hill an' there beint a hoss in these parts as kin do it faster'n a walk."

"What do you think about the car now?" asked Tom as they topped the hill and commenced to coast down the further side. "Isn't this better than jolting over the road behind old Nell?"

"Wall, ef I warn't so all-fired old ye wouldn't ketch *me* a-drivin' behind no hoss-critter arter this," replied the farmer. "I 'spect I'm a old fool, but ef 'tain't too much trouble I'd like reel well to have Mandy take a ride too. Would ye mind swingin' 'round by Grant's an' gittin' her?"

"O, we'd love to have Aunt Mandy come," cried Kitty. "It's no trouble at all."

At first Aunt Mandy flatly refused to enter the car but she gave in at last and with dire forebodings took her seat in the tonneau.

She soon overcame her nervousness and enjoyed the ride as much as her husband and when, after a run of several miles about the country, she alighted at her own door she was almost as firm a convert to autoing as was Gran'ther Joe.

By the time the pump and tank had been installed and a temporary shed built for the two cars the first of Tom's vegetables were sprouting.

"Goodness, what's the matter with these beans?" he exclaimed as in company with Ralph and Kitty he inspected the rows of tiny, green sprouts.

"Cutworms," replied his cousin as he examined the young beans, many of which were lying wilted and prostrate on the earth. "They're one of your

worst enemies and unless they're destroyed at once you'll lose a large portion of your vegetables."

As he spoke he was digging with his pocket-knife about the injured plants and presently exposed a small velvety-brown caterpillar curled into a half-circle.

"Here's one of the culprits," he exclaimed. "You see they hide in the earth during the day and come forth to devour the tender plants at night."

"We'll have some work if we've to dig over this whole field to catch them," cried Tom. "Do you suppose there are many of the beasts?"

"You won't have to dig over the field," laughed Ralph, "and no one can say whether there are five or five thousand in the ground. They're the larvæ or caterpillars of several species of small night-flying moths. Fortunately they are injurious for a comparatively short time and mainly attack the young plants. After the plants are large and strong they devour the leaves to some extent, but their worst depredations are committed early in the season before the plants are well started."

"How are we going to get rid of them without digging them out?" asked Tom.

"There are two ways of destroying the worms," replied his cousin, "and we'll employ both methods.

The first is to scatter poisoned dough, made of bran —as well as poisoned fresh vegetables—among the seedlings, and the other is to provide pitfalls for the worms. This is easily done by walking along the rows and pushing a hoe or rake-handle into the soil every few feet. The holes should be perfectly vertical and at least a foot deep. The worms will crawl into the holes at the approach of daylight and may be easily destroyed."

For several days Tom and Ralph waged their war upon the cutworms and when at last no worms were found in the pitfalls and none could be discovered about the poisoned cabbage leaves, clover and bran-dough, Selwin announced that all danger from the pests was over.

The seedlings now were well above the ground and formed straight, regular rows of delicate green across the dark earth while the earlier things, which had been transplanted from the hotbeds, were doing finely.

"We'll have to begin thinning the seedlings now," announced Ralph. "It's slow, tiresome work but very necessary."

"Well, if you say it's tiresome I'll bet 'tis," remarked Tom. "But if it's necessary let's get at it,

although I don't see the use in planting a lot of seeds and then pulling them up."

"There are several reasons for doing that," replied Ralph. "For example, how would you have fared with your beans if you'd only planted just what you expected to grow? Why, after a couple of nights' work by the cutworms it would have been necessary to plant the beans all over again or you'd have had long vacant spaces in your rows. By planting more seeds than you expect to raise you provide for just such a contingency. Then, in the second place, all the seeds planted will not sprout and to make sure you'll have enough, more are planted than could grow if all the seeds were good. Another reason for starting a large number of seeds and then pulling up a portion of the plants is that in this way the strongest and best plants may be retained and the weaklings destroyed."

"I can understand that," said Tom. "Where'll we start first? I suppose all we have to do is to pull out the poorest plants and leave the others?"

"That's the principle," said Ralph, "but it can't be done in such an off-hand manner as you think. In the first place different kinds of plants require thinning to a different degree and in most cases the thinning should be done gradually. In the case of

string beans and lima beans the plants should first be thinned until there is a space of about three inches between them and then a week or so after they should be thinned until six inches apart. Bush-limas should be thinned until twenty inches apart, carrots, parsnips, etc., to six inches apart, and radishes to two inches apart, but in the case of these delicate small seedlings the thinning must be done at intervals of several days. In many instances these small-seeded plants come up in close-packed groups and if you endeavor to remove some of these the others will be injured or disturbed. In such cases remove the whole bunch and allow individual plants to remain on either side. Beets and lettuce must also be thinned, but as the young plants may be used or marketed you should wait until the plants are fairly well-grown before the final thinning takes place."

"How about corn and potatoes and melons?" asked Tom.

"Potatoes seldom require thinning," replied his cousin, "and corn should be left untouched until all danger of insects and birds is over. It should then be thinned to one foot between the stalks, although if two or three stalks are close together it is wise to let them remain. The melons, squashes and cu-

cumbers should also be left until fairly well-grown and should then be thinned until the plants are three or four feet apart each way. If planted in hills two plants may be left to each hill. Of course the plants set out from your hotbeds do not require thinning."

"Shall I pull up the grass and weeds between the plants?" asked Tom.

"Leave them for the present," Ralph replied. "If you attempt to weed the rows now you'll do more harm than good. A little later we can pull up some of the weeds and destroy others by running a slender knife blade through them below the surface of the earth. Then by hoeing and cultivating, the weeds may be kept in check."

"I don't see what use horse or wheeled-tools are," objected Tom, "if we're compelled to move about on hands and knees over all this field."

"They'll come later," declared Selwin. "Until the plants are well started hand work is essential for the best results, but after a short time all the cultivation may be done by the various implements."

"It seems to me as if there were more weeds than vegetables," remarked Tom as he labored with Ralph in the field one day. "It's a pity they aren't some use."

The dandelion is a useful weed

"They are," his cousin replied. "Many of the worst weeds we have are quite valuable."

"Now you're trying to jolly me," declared Tom. "But you can't make me swallow that, Ralph."

"It's the truth, however," Selwin assured him. "We call things weeds just because they're a nuisance and grow without care or attention. A plant that's a weed in one place may be a highly-prized flower or vegetable in another district. I remember that when I was in the West Indies the first time, I was highly amused to see dandelions and mullein cultivated in gardens as flowers, while magnificent belladonna-lilies, portulaca, begonias, and salvias grew wild along the roadsides and were classed by the natives as weeds."

"I never thought of that," admitted Tom, "but still I don't see how any of our weeds can be valuable or useful. If they are why don't we use them? It seems to me that would be the right thing on a scientifically-conducted farm."

"It's a branch of farm work that will add quite a little to one's income," replied Ralph. "Many of these common weeds are used in medicine and are worth saving. Among them are dandelion, burdock, yellow dock, pokeweed, foxglove, couch grass, mullein, lobelia, tansy, boneset, yarrow, jimson weed

and many others. If you're interested I'll show you figures of the various things and tell you about preparing and marketing them to-night, but you'll hardly have time to do anything with weeds, there are so many more important matters to attend to."

"I'd like to hear about them just the same," declared Tom. "I'm anxious to learn all I can of everything connected with farming."

CHAPTER X

THE REWARDS OF LABOR?

"O Ralph! Come over here," shouted Tom as the two were working in the field one morning.

"What's the matter with these melons?" he asked as his cousin approached. "They're all wilted and look as if they were dead."

Ralph looked at the drooping vines and examined a few of the stalks.

"Borers," he replied. "See here." Splitting a stem with his knife he showed Tom the interior filled with little granules and bits of sawdust among which a slender worm squirmed about.

"Well, how did he get there?" asked Tom. "I thought with all our spraying we wouldn't have any trouble with insect pests."

"You've been wonderfully free from them," replied Ralph, "and all the spraying in the world is of little avail against these rascals."

"What can we do to stop them then?" exclaimed Tom. "Half the vines are affected already."

"There's not much we can do except to hunt out the stems that contain borers, cut them off and kill the larvæ and spray the vines thoroughly to destroy any moths or eggs."

For a long time the two worked away in the melon patch and when at last Selwin announced that there was nothing more to be done the place looked forlorn indeed. Where, a few days before, the broad leaves had covered the earth with a mantle of green there were now but a few almost leafless vines straggling across the field while many of the tiny young melons were scattered, withered and worthless, among the mutilated plants.

"Well, that's one crop that's going to be a failure," said Tom as he gazed ruefully at the melons. "And I'd counted a lot on my melon patch."

"Yes," agreed Ralph, "I guess you'll have little profit from the melons; but you'll have enough for your own use if no more borers attack them."

"I suppose it can't be helped," remarked Tom. "But if I'd known of the danger I'd have taken more care. I thought melons and such things could be left pretty much to themselves."

"You can't leave anything to itself," declared Ralph. "But you're lucky to get off so easily. You

can't attend to everything and I confess I'd overlooked the melons myself."

"Well, it's taught me a lesson anyway," said Tom as he picked up his hoe and started towards the house. "I'll remember to watch everything in future. But it's a shame to have all that land going to waste."

"You can plant some late crop there," said his cousin. "Land's never wasted on a properly conducted farm and what you can raise on this should partly make up for the loss of the melons."

They found Kitty deep in the mysteries of dairy work for they had now owned a cow for some time and under the tutelage of Martha, the hired girl, Kitty was mastering the details of separating cream, churning butter and making cheese.

"Oh, we've the cutest little chickens," she cried as Tom and Ralph entered. "Both the hens that have been sitting hatched out their broods to-day and we've twenty-one little white leghorns. The old hens are just as proud of their babies as if they were their own. Do you know, those tiny, fluffy things knew their foster-mothers just as soon as they were hatched. I watched them for ever so long and they never made a mistake, but ran straight to the hen that owned them whenever she called.

I can't understand *how* they can recognize the voices of the hens; can you, Ralph?"

"It's a mystery which has never been solved yet, and I don't attempt to explain it," laughed Ralph. "It's simply instinct I expect. The man who first coined that word ought to have a niche in the Hall of Fame though, he conferred an everlasting benefit on the scientific world. Anything we can't solve we can pass by as 'instinct' and let it go at that."

"You see, Kit, I wasn't so far off on my chicken calculations after all," remarked Tom laughingly. "If you keep on at this rate you'll have those thirty million hens overrunning the place in spite of yourself."

"I'll have so many that you'll have to busy yourself making brooders and coops," replied his sister. "So you needn't joke about it, Tom."

"Well, the more the merrier, sis. We can't have too many eggs, and broilers sell well."

"You'll need an incubator presently," remarked Ralph. "Hens are the best of incubators, but they can't handle as many eggs as the artificial affairs and you'll find it economy to buy a good incubator the next time you're in town. You can't always count on hens sitting when you want them to and the secret of successful poultry is to have broods

They now owned a cow

"The cutest little chickens"

hatching out every month during spring, summer and autumn."

"Why can't we raise ducks and geese and turkeys?" asked Kitty.

"You can," replied Ralph. "You can hatch any of those eggs under hens or in an incubator. Ducks and geese are all very well, but I'd not advise trying turkeys on a large scale; they're lots of trouble but there's no reason why you shouldn't raise enough for home use and a few to sell. Then there are pigeons—squabs are profitable—and guinea fowl, which bring good prices, and pheasants which are very beautiful and give enormous profits under certain conditions. All these may come later but for this season you'd better confine yourself to ordinary poultry, a few ducks, and perhaps one brood of turkeys—although half a dozen guineas would be no trouble. Gran'ther Joe has some guineas and I've no doubt he'd be glad to furnish the eggs."

"Are guineas of any use?" asked Tom. "I thought they were just curiosities."

"Guinea-fowl are excellent table birds," replied Ralph. "In Europe they are highly prized and were raised by the ancient Greeks and Romans. The first Europeans who settled in America brought guineas with them and in many of the West Indies

they are now found wild and are hunted as game, and in England they are also kept as game birds on many estates. In the United States little attention has been given to guinea fowl until quite recently and even now few people raise them in large numbers for the market. Here and there you'll often see a few, as at Gran'ther Joe's place, but they are usually kept more as ornaments or curiosities than anything else, although their cries serve as warnings of marauders and protect the other poultry to some extent. Their eggs are also good eating and are more delicate and are just as nourishing as hens' eggs. There is already a good demand for guinea fowl in the large markets and the young birds bring excellent prices as broilers, especially for hotel and restaurant use."

"Are they hard to raise?" asked Kitty.

"On the contrary they are very hardy and wonderfully free from disease," said Ralph. "Moreover they are never fully domesticated and love to range far and wide and will pick up their own living and require little feeding, and as they are particularly fond of insects and weed seeds they are very useful on a farm."

"Speaking of weed seeds reminds me that you were going to tell us about valuable weeds," re-

marked Tom. "Do you know, Kit, Ralph says there are lots of weeds that are useful and can be made profitable."

"If Ralph says so I'll believe it," Kitty stated. "But I always thought weeds were to be destroyed wherever possible."

"I was telling Tom that many weeds have a medicinal value," said her cousin. "And I promised to show him pictures of the useful kinds and to tell him how to prepare and market them. He'll not have time to devote to the matter with all his other work but he thought he'd like to know about it anyway."

"I'd be interested too," declared Kitty. "Why couldn't *I* make something from the weeds if Tom's too busy?"

"I think you've all you can attend to also," laughed Ralph. "I never saw two such ambitious people in my life. You expect to take up every branch of farm work in a single season and I must admit you're succeeding, too."

"Oh, Martha does all the housework now," cried Kitty, "and it's really little work, looking after the poultry and foxes, and since you connected the churn with the motor it's no trouble at all to make

our butter. I'm quite sure I can find time to prepare some weeds if it's not too difficult."

"It's simple enough," replied Selwin. "Useful weeds may be divided into several classes; those in which the roots are used, those with valuable leaves, those which have useful flowers or seeds and those in which all the various parts are valuable. The most important matters are to dry the plants carefully and properly and to keep them clean and absolutely free from other plants and all foreign substances. Medicinal plants that are clean, well-assorted and free from impurities will command good prices whereas the same things improperly prepared or impure will be worthless. A bright, natural color is demanded and this can only be obtained by drying the plants in the shade and protecting them from dew, rain and dampness and by covering them at night. Roots must be well washed before preparing, but leaves, stems, flowers or seeds should never be washed.

"Many medicinal plants are worthless if gathered out of season and you must collect each variety at the right time or they'll be refused by the dealers. Moreover roots will shrink a great deal more if gathered out of season than when dug at the proper time.

"Another very important point is to be absolutely sure that the plants are the right ones. Many plants so closely resemble one another that a mistake is easily made and while the two may look much alike yet one may have medicinal qualities and the other may not. Besides many of these plants, both those with medicinal value and those without, are poisonous and if wrongly classified might cause death or injury to the user. Whenever the least doubt exists the plant should be sent to some expert, such as a drug dealer or the State experiment station for identification.

"Roots must not be dug during the growing season as at that time they lack medicinal qualities and shrink a great deal in drying, whereas if gathered at the time of full maturity they will shrink but little and possess their greatest value."

"I can understand that," interrupted Tom. "It's just like digging potatoes I suppose."

"Yes," replied Ralph. "Roots of annual plants should be dug just before the plants bloom and those of the biennials and perennials should be gathered after the tops have died down and dried up. Annual roots are dug the autumn of the first year and biennials and perennials in the fall of the second or third year. After the roots are dug,

all the adhering earth is shaken from them and all litter, stones, dirt and parts of other plants are removed. They are then washed and carefully dried by exposing them to light and air, but not to sunlight, on racks or shelves or on clean floors of lofts. They should be spread thinly and turned daily until thoroughly cured. This may require from three to six weeks and when completely cured the roots will snap readily if bent. Many roots must also be sliced or split and as a rule the very large roots are split or sliced to hasten the curing process.

"Leaves and herbs should be gathered when the plants are in full flower and as it's important to preserve the bright, green color, careful shade drying is necessary. The entire plant may be cut and the leaves stripped from it and the stems and branches picked out and rejected, the coarse, large stalks being thrown out and only the tender stems, leaves, and flower-tops saved. All odds and ends, such as bits of grass, other plants, dead leaves and discolored or ragged portions should also be picked out and thrown aside.

"The leaves and flowers should then be spread in layers on clean racks or shelves or even on a loft floor in the shade where there's plenty of air and should be frequently turned until dry.

"Flowers must be gathered when they first open and not after they begin to fade and they're treated in the same manner as the leaves. Seeds are collected as they are ripening, but before the pods burst open and must be carefully picked over and winnowed to remove all bits of stems, pods and similar things."

"I think 'twould be just fun to prepare such things," declared Kitty. "I'm certainly going to try it anyway. But where can they be sold?"

"Samples of the plants and herbs should be sent to the nearest wholesale druggist or general commission-merchant with a request for quotations on the amount you can supply," replied Ralph. "If no merchant is near who can handle the weeds the nearest druggist can usually furnish you with the address of some dealer or wholesale house who can quote prices. The amount to be sent as samples depends upon the article. Usually four or five ounces, or a good handful is enough, and the package should be plainly marked with the name of the contents and your name and address. Where several firms quote prices select the nearest if the offers do not vary greatly, for freight and postage must be deducted from the profits."

"Can you give us any idea of what weeds bring?"

asked Tom. "I suppose they're pretty cheap and it's not worth while to bother with them, unless you've a lot to sell."

"Prices vary from year to year and they also depend upon the quality of the products," answered his cousin. "But they're much higher than you'd think. Common burdock has a root, as well as seeds, which are marketable. The price varies from three to eight cents per pound for the root and from five to ten cents for the seeds. Dandelion has a medicinal root and the prepared root, which is known to the trade as Taraxacum, brings from four to six cents a pound. Couch-grass, that persistent, troublesome weed known as witch-grass, quake-grass and dog-grass is a valuable medicinal plant and the roots sell at from three to seven cents a pound."

"I'd never have believed it possible," cried Tom. "Why I've been digging that miserable stuff from the vegetable garden for days and just to think that it's really worth saving. I suppose you'll tell me next that pokeweed and mullein and jimson weed are valuable."

"They're among the most valuable," replied Ralph, laughing. "Pokeweed is cultivated as a garden-plant in Europe and both the berries and

Mullein

Lobelia

Jimson Weed

Poison Hemlock

Bonesct

Tansy

Horehound

Yarrow

Couch Grass

Pokeweed

Burdock

Useful Weeds

roots are used in medicine. The root, known technically as Phytolacca, brings from two to five cents a pound and the dried berries are worth about five cents a pound. They are both used in the treatment of skin and blood diseases, for allaying pain and inflammation, and are poisonous. The despised mullein has leaves and flowers which are well known drugs but in order to sell the flowers they must be yellow and to retain this color they should be kept in tight jars or bottles after drying as otherwise they turn black. Mullein is used in curing catarrh and colds and for nervous irritation. The price of the leaves varies from two to five cents a pound and the flowers sell for twenty-five cents to one dollar a pound."

"And to think that old sheep pasture's just covered with mullein," exclaimed Tom. "What's the use of growing vegetables if you can make money from such things?"

"You'd find it takes a great many leaves and flowers to make a pound," replied his cousin. "Roots are really more profitable, even if the price seems lower, but you'd have hard work making your farm pay if you depended upon weeds. As long as weeds must be destroyed it's just as well to take a little care and make something from them, but it

doesn't pay to make it a business by itself. But to continue. Jimson weed is used in curing asthma and both seeds and leaves are saleable. To the trade it's known as Stramonium and is worth from three to seven or eight cents a pound. Another valuable weed is wild mustard, for the seed sells at from three to six cents a pound, but as it's raised in great quantities in some sections of the country it's not worth gathering in most places. The common yarrow, which grows so abundantly along the roadsides, is saleable, the entire plants being gathered and dried, in which form they sell at from two to five cents a pound while the somewhat similar tansy, known to the druggists as Tanacetum, sells for three to six cents. Other weeds which are used in medicine are foxglove, known as Digitalis and worth six to eight cents; lobelia, worth three to eight cents for leaves and fifteen to thirty cents for seeds; boneset known as Eupatorium and worth from two to eight cents and hoarhound which has leaves and tops that sell for three to ten cents a pound."

"I don't see why every one doesn't collect and sell these things if they're marketable," remarked Tom. "There's plenty of the weeds on every farm."

"Nevertheless the demand exceeds the supply," Selwin assured him. "And vast quantities of all

these medicinal plants are imported each year. You'd be surprised to learn that some twenty-five tons of burdock, sixty tons of dandelion, one hundred and twenty-five tons of couch-grass, thirty tons of foxglove, fifteen tons of tansy, over sixty tons of hoarhound, over seventy-five tons of jimson weed and ten tons of poison hemlock are annually imported to the United States and yet all of these things are to be had for the trouble of gathering and drying and our own farmers could readily supply the entire market and reap the profits which now go to Europeans."

"I should think 'twould pay to hire someone to gather and prepare the weeds on our farms," said Tom. "If those European farmers can afford to do the work and ship things here, American farmers surely should be able to make a profit when there's no high transportation charges to pay."

"It's a neglected industry," replied Ralph, "and there are many others of a similar nature. The struggle for existence has never been keen enough in America to compel the farmers to really make the most of their land. European peasants come over here and become well-to-do and prosperous on farms abandoned as worthless by their American owners."

"Well, no European peasant will ever get Ridgelea Farm as long as I'm alive," declared Tom. "I'm going to make 'book larnin' win."

The early vegetables were now coming thick and fast and Tom and Ralph had their hands full, gathering the crops in the afternoon and evening, washing and spreading them upon the grass and bunching them for market the next morning. They arose at dawn every day and long before the city dwellers had opened their eyes, Tom was speeding over the country road towards town with his auto loaded with the products of his farm.

There was no difficulty in disposing of his vegetables. Restaurants, hotels and private houses had learned the excellence of Ridgelea Farm products and the higher-class dealers clamored for a supply. All the eggs Kitty could furnish were engaged by regular customers and the few pounds of butter which could be spared from their own needs were eagerly purchased by Mr. Grayson. Hucksters and vegetable peddlers called daily at the farm to purchase produce and Ralph found little time to do anything but attend to them and direct John, the hired man.

"What on earth would we have done without a car?" exclaimed Tom on one occasion. "Imagine

The early vegetables were now ready

Tom sped over the roads towards town

trying to do all this with the old horse and wagon. I've made a trip to town, disposed of my load and am back here in time for lunch. I'm glad it's Saturday though and I won't have to work to-morrow, but I'll have to go to the mill for feed this afternoon."

The little grist mill with its huge willows and churning mill race was a picturesque spot and Tom always enjoyed talking with the flour-covered miller and watching the great mill stones as they noisily ground the corn and grain.

As he approached the mill he noticed the miller's cart standing outside the door with empty shafts but loaded high with meal.

The miller greeted him cordially and as he helped Tom place his bags of feed in the car, remarked: "'re lucky to have a buzz-wagon, Mr. Manville. See my cart a-standin' there. Old horse took sick this 'ornin' an' left me in a hole. Can't borrow no horse; everyone's so plumb busy, an' I promised that load o' meal to-day. Don't know how in blazes I'm a-goin' to deliver it. Reckon I'll have to get a machine myself if the old horse plays such tricks on me."

"I wondered why your cart was standing there,"

replied Tom. "It's too bad your horse is sick. Let me deliver the meal for you. Where's it going?"

"That's mighty kind of you," declared the miller. "But you can't truck all that load an' I wouldn't think o' lettin' you. It's goin' over to the junction."

"It *is* a good-sized load," admitted Tom. "I'll tell you what," he exclaimed, "we can fasten your cart behind the car and tow it over to the junction. You can sit in the cart, so as to use the brake on the down grades."

"Don't believe you can do it," said the miller dubiously. "But I *would* like to get that load over to-day."

"We'll try it and see at any rate," Tom insisted. "Get some rope and I'll back up in front of the cart and I'll bet we'll have that load at the junction quicker than you ever made it with the horse."

Much to the miller's surprise the car had no difficulty in hauling the loaded cart and as he sped up hill and down behind Tom's machine he became more and more convinced that the automobile was fully as much a necessity as a luxury in modern farm life.

"I tell *you*," he declared when Tom again drew up at the mill and helped unfasten the empty cart,

The little grist mill was a picturesque spot

"we've got to take off our hats to you city-folks after all. Come next year an' I'll bet a heap o' farmers in these parts'll be runnin' about in ortermobiles. I'm a goin' to have one right off. You don't ketch me a trustin' to a horse no more."

"I should think a good, light motor-truck *would* be a big help to you," said Tom. "But it *would* look funny to see some of the farmers driving cars. Imagine old Gran'ther Joe and Aunt Mandy scorching over the roads."

"Well, stranger things have happened," remarked the miller, laughing. "But old Joe *would* cut quite a figger in a ortermobile, I'll be bound."

"I thought you must have had a breakdown," exclaimed Kitty when Tom returned. "You said you were just going to the mill and you've been away all the afternoon."

"It was the other fellow who broke down," laughed Tom, "and I had to play the Good Samaritan." He then explained the cause of his delay and repeated the miller's prophecy and all laughed at the idea of Gran'ther Joe driving a car.

All through the early summer Tom, Ralph, and John toiled ceaselessly from dawn till dark, for as soon as one crop was out of the ground another was

planted and Tom found his sketch-plan of the utmost value in this work. Then there was the spraying to be attended to, the cultivation to be done, vegetables to be marketed and a thousand-and-one other details to be looked after.

Kitty, too, found little spare time on her hands. Even with Martha's help about the house there was much to be done, for the chickens had increased in numbers until several hours daily were required to feed and care for them; there was the dairy work to be attended to and the books to be kept. The flower gardens needed constant attention and in the attic of the house bundles of dried plants and boxes of seeds and flowers testified to Kitty's industry and her determination to make even the despised weeds add their quota to the profits of the farm.

"It's been ever so interesting to gather them," said Kitty when Ralph questioned her in regard to the weeds. "And I've learned a great deal about plants but I've decided it's hardly worth the trouble to prepare such things unless I give all my time to it. All the roots and leaves are *so* light after they're dried that it takes ever so many of them to make a pound."

"I wouldn't bother with them," said her cousin. "I feared you were attempting too much. You'll

lose all the good effects of farm life if you overwork."

"That's right," chimed in Tom. "We're not the only ones who've been working hard. You've certainly accomplished wonders, Kit. I don't see how you two girls have done so much. Let the old weeds go. By the way, how are the foxes getting on? I've actually been so busy I haven't even looked at them for a long time."

"They're doing finely," replied Kitty. "They've lost all that soft, fuzzy hair and their tails are getting bushy. They're almost as big as the old ones now."

"How soon can we tell if any of them are black?" Tom asked Ralph. "It's funny I haven't thought more about them."

"If they've lost their first coat of hair we should be able to tell now," replied Selwin. "We'll have a look at them."

It was scarcely surprising that Tom and Ralph had given little attention to the foxes. Early in the season they had been transferred to a specially-constructed run surrounded by shrubbery at some distance from the house, for the constant presence of strangers about the place kept the poor creatures

nervous and in addition the chicken house was needed for poultry.

When Tom and Ralph reached the run they found the animals quite wild and shy at their approach, although they showed no fear of Kitty and crowded to the wire-netting when they saw her.

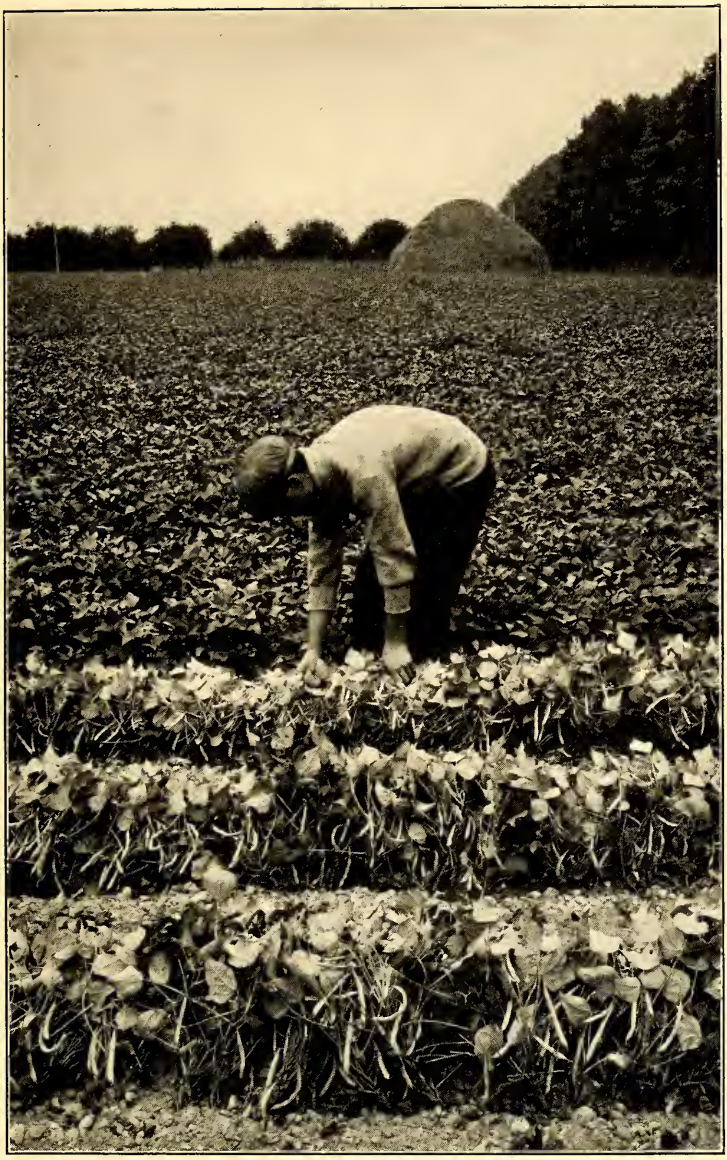
"That shows the importance of having one person look after the foxes," remarked Ralph. "They soon learn to recognize their attendant and show no fear, but a stranger will often drive them almost frantic."

"I don't see any black ones among them," said Tom. "I expected at least one would be like their father."

"There's no pure black one," admitted Selwin, who had been carefully watching the lively creatures. "But there are two good grays and at least one fine cross-gray. You may remember I told you that the second generation would be more likely to inherit the characters of their ancestors and I've no doubt that one of the parents of your black was a cross-gray."

"Then next season we should have some real black foxes," exclaimed Tom.

"You're likely to," replied Ralph, "but even if you raise cross-grays you've no reason to complain.



Gathering the crops

They're worth from twenty-five to fifty dollars for good ones."

"Isn't that run too small for all those animals?" asked Tom.

"It will be very soon," replied his cousin, "but 'twill answer until you're through with your vegetables and haying and then you'll have plenty of time to attend to it."

"Where do all these bees come from?" asked Kitty as she stopped to gather flowers on the way toward the house. "They're a perfect nuisance and we haven't any hives."

"They may come from a long distance," said Ralph. "Do any of the neighbors keep bees?"

"I don't think so," said Kitty. "I know Gran'ther Joe doesn't because Aunt Mandy wanted some honey one day and asked Tom to get it in town."

"Then they're very likely wild bees and may have a store of honey in the woods," Selwin declared. "It's not hard to find out. Let's follow the bees, Tom, and see if we can locate a bee tree."

"How can you follow a bee?" enquired Tom. "And what in the world's a bee tree? Do you mean to say bees live in trees?"

"Wild bees do," replied Ralph. "And frequently they accumulate hundreds of pounds of honey. In

many places hunting for wild bee honey is a very important and lucrative industry. As for following the bees, that's easy. Bees fly in a straight, or nearly straight, course to and from their homes and by watching the insects and following them the tree may be located. Sometimes a few bees are captured and carried in the direction indicated and are released at intervals and this makes the trailing easier."

"I suppose that's why people speak of a 'bee-line,'" said Kitty.

"Exactly," replied Selwin. "Now let's see if we can succeed as honey-hunters, Tom."

"After watching the bees for some time Ralph announced that they were undoubtedly wild bees and had a hive in the woods and having captured several insects which had gathered their loads of pollen the amateur bee-trailers made their way to the edge of the woods. Selwin had already noted the direction taken by the bees and led Tom to a point far to one side of the little bridge across the brook. Here they stopped and Ralph gazed steadily upward for several minutes. "I guess we'd better liberate one of our prisoners," he said at last. "The sun's so bright it dazzles my eyes."

As the captive bee was released from the little

pasteboard box in which she was confined Ralph and Tom watched her intently.

"She seems to know where she's going," remarked Tom as the insect buzzed off into the woods. "But I don't see how you're going to follow, here among the trees."

"Wait and see," laughed Ralph. "That's why I brought the bees along."

The direction which the bee had taken was followed for some distance, Ralph carefully scanning the trees as they walked along. Finally he halted and remarked: "Time to let another one go now."

This time the bee started off to the left and the two followed after.

"I think I understand the game now," announced Tom. "You walk a ways and then let a bee out and follow her. Then you walk a while in that direction and let another go and when you find that one goes back on the trail you know you've passed the tree. It's a regular 'hare-and-hounds' game."

"That's the idea," replied his cousin. "Now we'll release our third bee."

"Off to the right," cried Tom and followed by Selwin he hurried off in the direction taken by the bee.

"Don't go too far," cautioned Ralph. "The way

to do is to work up gradually. We'll let another bee out here."

"Right again," exclaimed Tom. "We must have gone past the tree. That one flew almost back the way we came."

"The trail's getting warm," agreed his cousin. "We'll have to be cautious now."

Presently the last bee was released and the two watched her carefully.

"She went to the left," announced Selwin. "And almost directly back. The tree must surely be between here and the spot where we released the last bee and it's not far to one side either. Look at every tree carefully, Tom."

"Hurrah, I've found it!" shouted Tom a few minutes later. "Goodness; what a crowd of bees there are up there. You can hear them buzzing like a sawmill; that's what attracted my attention to it."

"That's the tree all right," said Ralph, as he looked up at the half-dead basswood tree. "And judging by the number of bees there's a lot of honey in it. How do you like bee-trailing, Tom?"

"It's a fine game," replied Tom. "But what I want to know is how we're to get that honey. I'd hate to climb that tree and try to rob those bees."

"We'll smoke out the bees and get the honey easily enough," Selwin assured him. "But to make sure of not being stung we'll wear gloves on our hands and nets over our faces. Now we've located the tree we'll go home and can come back later with axes and all the appliances and with John to help."

After several hours' work the angry insects were subdued, an entrance to their home was chopped in the tree and John reached in and drew forth a dripping piece of comb. For a moment he examined it and then cast it violently into the woods.

"What's the matter?" cried Tom. "Why did you throw the comb away?"

"Durned stuff's plumb full o' moths," replied John in a disgusted tone as he commenced to descend the ladder.

"What in the world does he mean?" asked Tom, turning to his cousin. "How can there be moths in honey?"

"Bee moths," replied Ralph. "Small moths which infest hives and the larvæ of which destroy the wax and ruin the honey. They're sometimes called 'wax moths' and are much like the common clothes moths which ruin furs and garments. I guess we've had our trouble for nothing."

"Well, we had a lot of fun finding the tree and trailing the bees at all events," declared Tom.

"I know the secret of making a farm pay now," announced Tom as he threw himself into the hammock beneath the trees one evening. "You can talk all you want about up-to-date methods, scientific theories and such things, Ralph. They're all right, I'll admit, but the main thing is work, with a big capital W."

"You're right there, Tom," agreed his cousin. "All the modern methods and ideas in the world won't spell success without work. Are you getting tired of farming?"

"Not a bit of it," declared Tom. "I'm dead tired every night but I'm chipper as ever the next day. It might be different if things weren't going well, but everything's booming and when I do feel a little too tired I've only to think of the poor fellows up in Grayson's office. I'd rather tackle all the farm work single-handed than go back to a desk."

"The worst's over now," said Ralph. "Everything's planted, and there's little cultivating to be done. There's not much left now except to gather the late crops, do the haying and get ready

for another year. From now on you'll be getting back the fruits of your labor."

"Or as you might say, reaping our profits," suggested Kitty.

CHAPTER XI

CONQUERING THE DROUGHT?

It was good haying weather and Tom found mowing the grass, raking it into piles and carting the great, fragrant loads of hay to the barn a very pleasant change from the garden work.

"We'll have more than the old barn will hold," he remarked to Ralph. "It's pretty near full now and there's still a lot in the fields."

"What won't go in the barn can be made into stacks," replied his cousin. "Hay never comes amiss and you'll be surprised to find how much your horse and cow will require during the winter."

Tom was greatly interested in the construction of the haystacks, for while he'd seen them many times about the countryside yet he had no idea how they were made or what they were for.

"I should think the hay would get soaked through and through out in the open," he said to Ralph. "If it can be piled up this way what's the use of a barn?"

It was good haying weather

"The hay keeps much better in a building, of course," replied Selwin, "but in stacks there is very little loss. Hay sheds water like a roof and in many countries the roofs of houses and sheds are thatched with it. Moreover, the weight of the hay compresses the pile until it is very compact and the hardest rain or snow storms will not penetrate it. In fact, a modern rifle or cannon-ball will enter a well-built haystack but a short distance. They make the best of breastworks in warfare. Of course hay kept in stacks, or ricks, is inferior to that kept in barns and if the stacks are carelessly made the hay may become mildewed or mouldy. A great deal depends upon using thoroughly well-cured hay, stacking it carefully and arranging the top layers to shed water. Many farmers spread canvas or cloth over the tops of the stacks, but this is not necessary."

"How long will the hay in a stack remain good?" asked Tom.

"Several years sometimes," replied Ralph. "But it's only intended for one season. You can use the hay from the stacks first and depend upon that in the barn for winter use or you can keep the stacks for spring. Even if the hay in the stacks is not as good as that in the barn, it will do nicely for bed-

ding. Moreover, it may be fed to the cow when she's out-of-doors in the spring."

"They make the farm look good and prosperous anyway," remarked Tom, when the big stacks were at last completed.

"Now to cut and gather the corn stalks," announced Ralph when the haying was finished.

"I didn't suppose they were any use," exclaimed Tom. "Why, everything seems to be worth saving."

"Dried corn stalks are excellent for the cow," replied Selwin. "There's little waste on a properly conducted farm."

"This is where the big elm comes in handy," cried Tom as he threw himself down in the shade one scorching day. "My, but isn't it hot?"

"Yes," agreed Ralph. "It's certainly hot and there's no sign of rain. We've been blessed with good growing weather so far but it hasn't rained for over two weeks and things are getting pretty well dried up. Unless we have a good shower to break the drought, your late crops will suffer and we'll have to water them artificially."

"How can we do that?" asked Tom. "We can't run a pipe down here and all the water in the well wouldn't water these fields."

"We don't need to run a pipe and we won't use the well," replied Selwin. "If we have to irrigate we'll use the water from the brook. It's nearer than the well and there's plenty of water in it for our purposes."

"How can we get the brook water up here? It won't run up hill," exclaimed Tom.

"It won't run up hill of its own accord, I admit," said Ralph. "But we can *make* it run up by using a pump."

"Hadn't we better get a pump and put it down there and have it all ready?" asked Tom. "But it seems to me as if it would be mighty hard work pumping water from the brook all day."

Ralph laughed. "Oh, you needn't worry about that," he said. "We'll use the pump up at the house and run it by power."

"You mean you'll move the motor and all down to the brook. That's quite a job."

"No, we won't have to do that," replied his cousin. "We'll move the pump alone and run it by auto."

"How in the world can you run the pump by auto?" asked Tom.

"It's perfectly simple," said Selwin. "We'll disconnect the pump and mount it on the sled and

place it close to the brook. Then we'll jack up the car, take off one of the rear tires, run a belt from the rim to the pulley on the pump, start the motor and throw in the third speed."

"That's great," cried Tom. "I never thought of using the car to do such work."

"If you didn't have a stationary motor you'd find a car mighty useful for running machinery," declared Ralph. "Buzz-saws, lathes, grindstones, pumps, churns and in fact any farm machinery can be operated in this way and many up-to-date farmers use their machines for a variety of such purposes. Some of them even have a skid, onto which they run their car, and by providing a roller or friction wheel to bear against the rear wheels of the car there is no need to remove a tire."

"How will we get the water from the pump to the fields?" asked Tom. "We'll need a lot of new pipes to reach up here."

"We can run a few lengths of pipe up to the little knoll," replied Ralph. "And from there run trenches through the fields. I think there'll be enough grade to make it flow over all the lower field. While we're about it we might as well survey the garden and find out. If there's not enough slope to carry the water we can fill a cart with bar-

rels, run the water into these and cart them about the fields and empty them where we think best."

"Isn't that an awful lot of work?" asked Tom. "And, by the way, how are you going to survey the fields. We haven't any instruments."

"The work isn't anything compared to the value of the crops you'll save," declared Ralph. "And as for surveying, we've all the appliances we require. Come up to the house and we'll get them right away. We might as well be prepared."

Equipped with a bucket and a shingle, Ralph led the way to the brook where he filled the bucket with water and then walked to the top of the little knoll he'd mentioned.

Here he stopped and splitting two pieces of equal length from the shingle, set them in holes in the remaining piece and placed this on the surface of the water in the pail. He then measured off spaces six inches apart on a pole he had cut beside the brook and handed this and a foot-rule to Tom.

"Now I'll show you how to survey with primitive instruments," he announced. "Walk straight toward the Elm for fifty paces and then hold this pole upright, with the lower end resting on the earth. Place the rule across the pole at right angles and move it up or down as I direct by motions of my

hand. When I hold my hand steady, note the exact spot where the upper edge of the rule crosses the pole and jot the number of feet and inches on a bit of paper. When I drop my hand walk another fifty paces toward the tree and repeat the operation and continue to do this until I stand up."

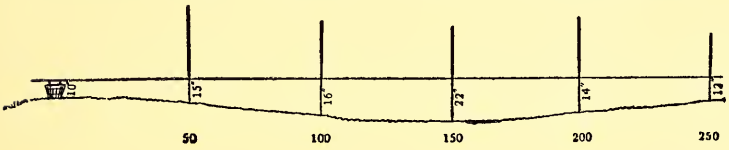
"It's all a mystery to me," admitted Tom, "but I'll do as you say."

He commenced striding off across the field. When the first fifty paces were covered he followed Ralph's directions and jotted down 13 inches. At the next stop 16 inches were registered; at the next 22 and at the fourth point 14 inches. When he reached a spot 250 paces from the knoll 12 inches were recorded and his cousin signaled him to return. Ralph took the paper on which the various marks were written, drew a note book from his pocket and made a rough sketch.

"That's the sectional view of your field," he declared. "The grade runs down for 150 yards and then there's a slight rise. We can irrigate the whole of this lower field by piping direct from the pump to the knoll, but we'll have to cart the water beyond there. If the drought keeps on we'll get the pump started and be sure of the crops in this field at any rate."

"Now please explain how you know all this by using a pail of water and a pole?" begged Tom.

"The pail with the water forms a perfect level," explained Selwin, "and by sighting across the two sticks of equal height and motioning you to move the rule up or down the pole I determined the point which was exactly the same height above the ground



where you stood as the sticks floating on the water in the pail. Then by noting this I knew just how much slope there was between the knoll and the spot recorded. In other words, the grade was 15 inches in fifty paces, or approximately 5 inches in 150 feet, for the sticks were 10 inches above the earth. The next record gave a fall of 16 inches from the knoll, or one inch in the second 150 feet. The third proved there was a still further slope of six inches, but the next two readings proved that the field sloped up grade eight inches in 150 feet and continued to rise for two inches more. Thus the last stand you made was twelve inches below the level of the water in the pail or two inches

below the knoll, and if there was no intervening hollow the water would flow over the fields for 750 feet or more. As it is, we'd be obliged to flood this first field to a depth of ten inches in order to make it reach the crest of that little rise which is imperceptible from here."

"That's mighty interesting," remarked Tom. "But I've an idea. If the lowest point is 22 inches below here why can't we make a tank or a hole there and fill it with water and then pump it from there over the next hill?"

"So we could, if we had time," replied his cousin, "but it would require a very large tank or cistern and by the time you had it ready it would be too late to save the vegetables."

"Well, I mean to have one all ready for next year anyhow," declared Tom.

"It would be far better to drive a well in the field and put up a windmill," said Ralph. "It would cost more perhaps, but you'd always be certain of an available water supply for your crops."

The drought continued unabated and Ralph and Tom, following their plan, erected the pump beside the brook, laid the pipe to the knoll and attached the automobile. As the water poured from the pipe and spread upon the field, ditches were rapidly dug

between the rows of plants, ridges of earth were piled up to guide the water here and there and before nightfall the entire field had received a good drenching and the drooping, thirsty plants already showed signs of improvement.

"Gracious! Don't those things look better," cried Tom as they reached the field the next day. "They're just as fresh and green as ever and yesterday morning they looked half-dead. Let's hurry up and water the other things."

It was hard, slow work, watering the other field, for only four barrels of water could be carried at a time on the wagon and care had to be used in driving across the field. Tom handled the horse, John was kept busy digging ditches to distribute the water and Ralph directed and helped the other two in emptying the barrels.

"I wonder if we couldn't borrow Gran'ther Joe's horse and wagon and make the work easier," said Tom at the close of the first day's work. "I don't believe he's using them and we could do twice as much. I'm going over to ask him."

Tom found the old farmer haying in the meadow which had not as yet felt the effects of the dry weather.

" ' Course ye kin borrer 'em," Gran'ther Joe re-

plied to Tom's request. "I ain't no use fer 'em terday an' this here hay'll wait 'till yere done with 'em. What ye want em fer, cartin' hay?"

"No, carting water," replied Tom. "We're irrigating our vegetables and can't do it fast enough with one cart and horse."

"What in tarnation's 'irrigatin'?" demanded the old man. "What ye cartin' water fer? Well give out, eh?"

"No, we're carting water to put on the vegetable fields. That's what I mean by irrigating; watering the vegetables so they won't dry up."

"Well, I swan!" exclaimed the farmer. "Of all ther fool notions ever I heard on. The idee o' watering crops. I 'spect that's some o' yer book larnin' schemes, eh?"

"Come over to the farm and you won't think it so foolish," said Tom. "My vegetables are fresh and green but all the others about here are drying up. If this drought keeps on nobody'll have any late crops at all unless they irrigate."

Gran'ther Joe squinted up at the sky and off to the west and remarked:

"Reckon it's due ter rain purty quick. Looks kinder hazy an' my rheumatiz is a startin' to ache. Hain't never watered my crops an' I mos' gin'rally

Grand'ther Joe was haying in his meadow

pull through. Mebbe I'll come over ter ther farm bimeby and hev a look at what yer a doin', jest fer cur'osity."

The additional horse and wagon made the work far easier and quicker but it was still very slow as compared with the direct pumping by which the lower field had been flooded.

"I'm glad that big cornfield and the early potatoes are finished and don't have to be watered," remarked Tom as the three stopped for their noonday rest. "Think what a job we'd have, to cart water clear up there."

"Even so, it would be worth the trouble," said Ralph. "You can note the improvement already and by to-morrow night we'll be finished. If no rain comes we'll have to repeat the irrigation work in a few days."

"I won't get caught this way another year," declared Tom. "I thought the hardest work was all over, but if anyone wants to know what real work is he can just try watering five or six acres of dried-up land on a roasting hot day."

"You've saved your late crops and I'll wager you're the only farmer about here who has," replied Selwin. "Don't you think the results are worth the labor?"

"Surely," admitted Tom, "but why on earth don't the others have wells or pumps or something to water their fields. I'm a new hand at it and I didn't plan for a drought, but if I'd been farming as long as these other fellows I'd have known enough to be ready for a dry spell. There'll be a well and a pump in the middle of my fields next year if it takes all my profits to put it there."

"Farmers are a conservative lot," remarked his cousin, "because fathers and grandfathers didn't irrigate they don't think it necessary and yet year after year they lose many times what it would cost to drive wells and erect pumps for use in time of drought. In many places irrigation is absolutely essential and even the most arid and barren deserts will produce enormous crops if properly irrigated. In the west it's a matter of course, but in the east farmers trust to nature and have become fatalists in a way. The old saying that 'the Lord helps those who help themselves' is an excellent proverb for farmers to remember."

Day after day the blazing sun shone from a cloudless sky. The earth was dry, hot and parched, the fields of grass grew yellow and brown; the wayside weeds drooped, dust-covered and forlorn, while growing crops withered in the fields and the half-

grown fruit strewed the ground of the orchards. Far and wide the countryside looked burnt, seared and dead, but in the midst of the desolate landscape the fields and orchard of Ridgelea Farm showed like an oasis of green. From morning until night the water had been pumped from the little brook and spread among the vegetables until the stream itself had dwindled to a mere rill. Then the pump had been replaced in the woodshed and the precious water from the well had been poured in hollows made about the fruit trees until all that could be safely spared had been distributed and Ralph announced that nothing more could be done. Tom had made numerous early trips to town to deliver vegetables and with the scarcity of such things, due to the drought, he had found no difficulty in disposing of even the cheapest garden products at prices as high as he had obtained for his early vegetables in the spring.

"How yer gittin' on with yer 'irritatin', er whatever ye call it?" inquired Gran'ther Joe when Tom returned his horse and wagon. "Reckon ye found it kinder stumped ye, ter treat them fields like er posy-bed, didn't ye?"

"It *was* hard work, I'll admit," Tom replied,

"but it's all done and things are looking fine. Come up and see them, Gran'ther."

"Dunno but I will," answered the farmer. "Fust time I ever heard o' sech carryins-on, but I've seed a heap o' new idees sence you folks come up here an', as I says to Mandy, 'tain't no use a-talkin', they's somethin' to larn every day.

"Wall, I wouldn't er b'leeved it ef I hadn't a-seed it with my own eyes," declared Gran'ther Joe as he reached the farm and gazed at the green-leaved orchard trees and healthy, growing crops. "Don't look es ef no drought had struck here 'tall."

Tom and Ralph took the old farmer about, explained the pump and showed how they had distributed the water and when finally Tom declared that before another year came around he was to have a driven well and windmill in the center of his fields, Gran'ther Joe was quite convinced that irrigation was worth while.

"Wall, I dunno as I got ernough growin' crops on my place ter bother 'bout this ere 'irritatin'," he said. "Most of my farm's hay land an' purty low an' damp, but ef I wuz a-raisin' garden truck ye bet I'd hev things fixed up ter beat a drought. Yes, sir, they ain't no two ways erbout it; book-larnin' wins every time."

CHAPTER XII

UNCLE ABNER ADMITS HE'S WRONG

"I WONDER what's become of Aunt Mandy and Gran'ther Joe," said Kitty as she and Tom were going to town one morning in early fall. "I haven't seen them since Aunt Mandy came over nearly two weeks ago," she added, "and their house seems shut up. Do you suppose they've gone away?"

"I dont know," replied Tom. "I saw Gran'ther Joe four or five days ago. I met him on the road and stopped to talk with him a few minutes. He didn't say anything about going on a visit; just enquired after you and Ralph and asked a lot of questions about the car the way he always does. Said Akers over at the mill told him about how I towed his cart to the junction."

"There's a machine coming behind us," said Kitty presently. "You'd better turn out, Tom, and let it pass."

"I hate to be forever letting other cars pass us," declared Tom, touching the accelerator slightly.

"People will begin to think this old boat can't make over 15 or 20 miles. I'm a good enough driver to pass some of the other fellows now and I don't see why you're always so nervous."

"I know you can drive splendidly," agreed Kitty. "But I'm always afraid something might give out if we went too fast. Tom, you're scorching! Please don't try to race."

"No, I'm not," laughed Tom. "We're not going over thirty miles and I'm not fool enough to try to race that big yellow roadster. It's got twice our speed. I wonder who owns it?"

"I don't know," answered Kitty. "I never saw it before."

"Well, she's a peach of a car," exclaimed Tom, as a moment later the racy, yellow machine dashed past in a cloud of dust and with its occupants unrecognizable in dusters and goggles.

"But that fellow's not been driving long," he added; "look at the way he swerves back and forth."

Presently the car ahead slowed up and stopped at one side of the road.

"I wonder what's the matter with him," remarked Tom. "Guess I'll ask him if he wants any help."

As they came to a standstill beside the other ma-

chine Tom and his sister stared at its occupants in speechless amazement, for seated in the low, yellow roadster were Gran'ther Joe and Aunt Mandy!

"Kinder s'prised ye, didn't we?" chuckled the old man. "Thought I'd hit her up a bit an' see ef I could pass ye an' I did, by Gum! Not bad fer a ol' farmer, eh? Thought I'd let ye see city folks ain't the only sports."

"When *did* you get that car?" cried Kitty, finding her voice at last.

"And where did you learn to drive?" exclaimed Tom.

Gran'ther Joe broke into a hearty laugh, in which Aunt Mandy joined.

"Bought it 'bout two weeks back," replied the farmer. "Been a-takin' lessons up ter ther orter-mubbile school in town mos' every day sence. Ter-day's the fust time I've druv out with Mandy er-lone. Been a-practicin' with a 'chuffer' up ter now. Didn't want ter make no consarn fool o' myself or smash ther enjine. Reckon I kin handle the con-traption O. K. now, ef she don't balk or take ther bit in her teeth."

"You certainly have surprised us all right," Kitty assured him. "We never dreamed of you getting a car."

"And such a dandy, too," exclaimed Tom. "Why you put ours completely in the shade."

"Wall, I kinder hankered arter one sence I rid in yourn," remarked the old man. "An' I says to Mandy, 'Mother, they's no use er talkin', we ain't goin' fer ter die afore our time an' we might ez well hev a good time while we're on 'arth. I'm a-goin' to git us a ortermubbile.' At fust she wuz dead sot agin it—called me a ol' idjit an' all that; but I reckon she's enjiyin' it ez well ez I be now. Wall, I argied with her and I sez, I reckon ef them city folks kin come out an' lick us ol' farmers a-raisin' garden truck they ain't no reason why I can't larn to drive a ottermubbile. But I swan! I dunno as I'd a gone agin her ef it warn't fer ol' Bill Akers over ter ther mill. Bill sez as how he was a-goin' ter git er ottermubbile and then he sez: ' 'Spect you'll be a-runnin' roun' in one, too, Joe. Nice figger you'll cut in er buzz-wagon!' Gosh all Hemlock, when that there ol' beetle-bug sez that I riz right up an' I sez: 'Bill Akers, I bet ye I'll be a-drivin' 'round in one o' them contraptions 'fore ye be an' when I do,' sez I, 'ye won't never give me your dust, Bill Akers; not ef ye hitch yer consarned ol' mill-wheel on ter yer enjine ter help ye.' "

"Oh, Gran'ther, you're just too funny," cried

Kitty between peals of laughter. "But you've a fine car and I know you and Aunt Mandy will enjoy it ever so much. Please don't race and kill yourselves, though."

"I'll have to take the blame for what the miller said," admitted Tom. "But I didn't expect he'd repeat it to you and I'll take it all back. You look as if you'd been accustomed to a car for years."

"That's all right, son," cried Gran'ther Joe. "I don't mind you youngsters havin' yer fling, but I won't take sass from no miller. What der ye think o' the rig-outs Mandy an' me's a-wearin'?"

"They're fine," announced Tom. "Just what you need for motoring."

"Wall, *I* think we look like er couple o' ol' hop-toads myself," declared the farmer. "The feller what sold me ther car says as they be the *ke*rect rig-outs, so I reckoned they wuz all right an' bought the hull bisness ter onc't."

"Now you have a car, you must come to see us often," said Kitty as they prepared to drive on. "We haven't seen you for a long time."

"Sure, we'll drop in," agreed Aunt Mandy. "Joe kinder wanted ter s'prise ye with the car, but there's a heap he wants ter larn about it, an' Tom and Mr. Selwin kin help him a lot."

Ralph was greatly amused when he learned of Gran'ther Joe's car.

"I'm not really surprised," he said. "I noticed the old man took an unusual interest in our cars after his ride, and I judged by his questions he'd been looking into the matter. Old as he is he's still young in spirits and is a keen lover of sport. Nothing will delight him more than passing his neighbors on the roads and 'showing off.' But I didn't think he'd go quite so far as to buy a high-powered racing roadster."

"Now you see the results of your hard labor at pruning the trees," remarked Ralph, as he and Tom were gathering the apples in the orchard. "Your crop isn't very large, but the fruit is all sound, fair and of splendid size."

"And everyone else is complaining because the apple crop's a failure," said Tom. "I suppose irrigating the trees saved ours."

"Yes, but if the trees had not been pruned, a great deal more irrigation would have been required. The amount of water any plant absorbs is in proportion to the evaporation from its leaves. Your trees could devote all their vitality to producing fruit and were not compelled to let the fruit suffer in order to maintain an unnecessary growth of foliage."

"It's lucky we didn't have a fire during that drought," remarked Tom. "Mr. Grant says that over in Simsville the forest fires destroyed thousands of acres of timber."

"We've much to be thankful for," agreed Ralph. "Your crops, with the exception of the melons, have all done well. You've a barn full of hay; your poultry has increased amazingly; you've the nucleus for a remunerative fox farm; you have a comfortable home of your own, and you've made Ridgelea Farm something to be proud of. And, best of all, both you and Kitty are healthy and happy."

"Just the same most of the credit belongs to you," declared Tom. "We'd never have succeeded without your help."

"Or, to go back further, why not give your Uncle Abner the credit?" laughed Ralph. "But that's not the point. If you hadn't taken hold with a will, and Kitty and you hadn't worked with determination to make your farm a success, nothing would have been accomplished."

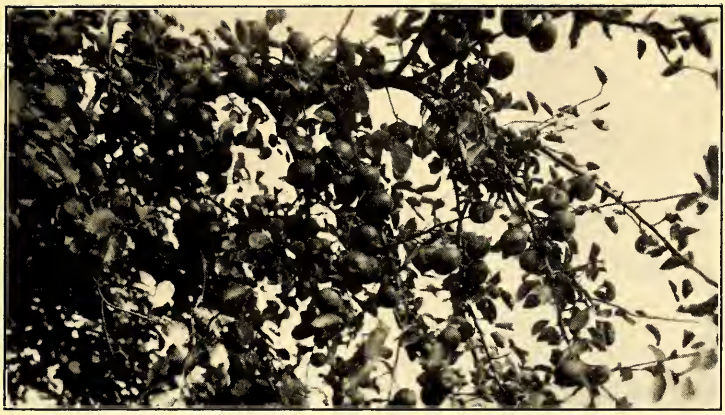
"Speaking of Uncle Abner reminds me it's almost time to visit Mr. Morton and hear the contents of those mysterious papers," exclaimed Tom. "I'd almost forgotten about them. Goodness, it doesn't seem possible we've lived here nearly a year."

"Time *has* flown," admitted his cousin. "Have you and Kitty balanced your accounts to see how much you've cleared?"

"No," replied Tom. "We've balanced them from month to month, and I know we're way ahead on profits, but we decided to wait until all the crops were in and all expenses for the year had been paid, and then see how accounts stood for the entire year."

"That's a good plan," agreed Ralph. "Your late potatoes and a few other vegetables and your nut crop are all that remain now. Then you'll have time to go over the books. It might be a good idea to show Mr. Morton a statement of the accounts. As executor of the estate I've no doubt he'll be greatly interested—especially as the farm was always a losing proposition during my stepfather's lifetime."

The late vegetables were safely harvested, the final potatoes were dug, and in the sharp, frosty, autumn days Tom, Ralph and Kitty spent many hours gathering the brown-shelled nuts among the brilliant fallen leaves. At last all the products of the farm were garnered, the fields were mulched, the crimson clover, vetch and cow-peas were plowed under, and the owners of Ridgelea Farm commenced



Tom's apples were sound and of splendid size

The late crops were harvested

the task of tabulating their expenses and receipts. The list was long, for Kitty had been faithful to her duties and every item was carefully recorded, but after several days spent with books and papers the work was completed and the final result appeared as follows:

Expenses		Receipts	
Moving	$ 10.00	Cordwood	$1,168.00
Repairs on house	200.00	Flowers, bulbs, boxes, etc.	251.05
Shingles, etc., barn	100.00	Hickory timber	46.00
Furnishings	150.00	Eggs	55.24
Hens (42)	72.00	Butter and dairy products	24.96
Books and magazines	5.75	Vegetables	2,681.15
Seeds, bulbs, etc. (flowers)	64.50	Fruit	153.20
Hot-beds and cold-frames	53.00	Nuts	36.55
Carpenter tools	30.00	Weeds	4.05
Netting	9.00	Lease of trout brook	150.00
Sash	51.00		$4,571.15
Horse and wagon	210.00		
Harness	12.00		
Axe	2.25		
Circular saw	11.00		
Mandril	3.00		
Belt and pulley	3.60		
Gasolene	92.40		
Oil	7.40		
Chopper (for lumbering)	30.00		
Rotary pump	18.00		
Water tank	15.00		
Pipes and hose	16.00		
Counter shaft	12.00		

Expenses		Receipts	
Bone cutter	$ 12.50	Brought forward	$ 4,571.15
Farm tools and repairs	75.00		
Insecticides	6.00		
Manure and fertilizer	450.00		
Farm seeds	200.00		
Cow	50.00		
Feed	203.60		
Automobile	275.00		
Garage	110.00		
Horseshoeing	25.00		
Auto expenses	35.00		
Hired man	120.00		
Martha	90.00		
Living expenses	459.25		
Clothing	50.50		
Insurance	101.10		
Incidentals	102.25		
	$3,554.10	Expenses	$ 3,554.10
		Balance	$1,017.05

"That's a fine showing," declared Ralph. "But there's one thing you've overlooked. You've entered the cost of the machines, tools, hot-beds, live stock, etc., but these are really so much capital invested while the hay on hand has a definite cash value. You should add these to the total sum for they are just as much assets as your money in the bank."

"I hadn't thought of that," admitted Tom.

"Goodness, that makes a deal of difference, doesn't it?" He handed his cousin the following corrected statement:

Assets			
Bone cutter	$ 12.50	Cow	$ 50.00
Furnishings	150.00	Garage	110.00
Hot-beds and sash	104.00	Automobile	275.00
Tools	30.00	Hens	72.00
Horse, wagon, harness	222.00	Hay	200.00
Axe, saws, machinery, etc.	80.85	Foxes	400.00
Farm implements	75.00		$1,781.35
		Net profits	1,017.05
		Total	$2,798.40

"Mighty few farms of this size can show a balance equal to that," announced Ralph. "Your Uncle Abner ought to rise up from the grave and compliment you."

"He'll have to if he's going to admit he's wrong, as he promised," laughed Tom. "But there's one item we haven't included yet and to my mind it's the most important of all. That's experience. We've learned all sorts of things from raising vegetables to running motors and machinery; we'll do twice as well next year."

"To-morrow's the anniversary of our taking possession of Ridgelea Farm," said Kitty. "I'm just wild to know what those papers will reveal."

"We'll know by to-morrow night at this time," remarked Tom.

Mr. Morton welcomed the visitors cordially. "I see you recollected the date," he remarked. "I was about to notify you that the stipulated time had expired but waited to see if you would bear it in mind. How is the farm progressing?"

"We've done splendidly, thanks to Cousin Ralph," declared Tom. "Here's our year's account. We thought you might be interested in looking it over."

"Hum, that's certainly an excellent report," said Mr. Morton as he glanced over the paper. "You are to be congratulated. I had no conception that a small farm in this vicinity could be made so highly remunerative, especially by amateurs as one might say."

"Modern methods and scientific theories did it," remarked Tom.

"Not forgetting plenty of hard work," added Selwin.

"An excellent combination I should surmise," said Morton. "But I presume you are anxious to learn the contents of the late Mr. Bennett's sealed papers."

As he spoke he drew a package from the safe and placed it on the desk.

"This first package," he remarked, "I am directed to open and read in your presence on this date."

Then, breaking the seals and spreading out the sheets of paper, he read the contents, which omitting the legal terms and details, ran as follows:

"This being a duly attested and properly executed codicil to my last will and testament, I, Abner Bennett, bind and direct my executors to fulfill the following provisions. First: If upon the date of reading this codicil Thomas and Kathryn Manville still retain possession of Ridgelea Farm and can prove to the satisfaction of my executors that the property is free from debt or mortgage and that during the twelve months which they have occupied Ridgelea Farm they have jointly or severally earned a net profit of not less than one thousand dollars from the said property I give and bequeath to the said Thomas and Kathryn Manville the sum of five thousand dollars each. The said sum being contained in the package marked Number 2 and entrusted to the care of Mr. Henry Morton in company with this codicil.

Second: If upon the date of reading this codicil it can be proved to the satisfaction of my executor

that my stepson, Ralph Selwin, has aided the said Thomas and Kathryn Manville in the management of Ridgelea Farm and that through his aid or advice, either wholly or in part, the said profit of one thousand dollars or more has accrued, I hereby give and bequeath the following: My property known as "The Maples," with its contents; the inventory, keys and deeds to which are enclosed in the package marked Number 3 and which is entrusted to the care of Mr. Henry Morton, in company with packet Number 2 and this codicil.

"Third: If at the time of reading this codicil it appears that Thomas and Kathryn Manville have not retained possession of Ridgelea Farm or have leased, sold, mortgaged or otherwise disposed of it or have failed to realize a net profit of one thousand dollars or more as stipulated, then the sum of ten thousand dollars contained in package Number 2 shall be devoted to charity as hereinafter provided for.

"Fourth: If upon the reading of this codicil it appears that my stepson, Ralph Selwin, has not aided Thomas or Kathryn Manville or has in no manner been responsible for any profits which have accrued from Ridgelea Farm, the property known as "The Maples," with its contents, shall be sold at

public auction to the highest bidder and the proceeds of said sale shall be devoted to charity as hereinafter provided for."

At this point Mr. Morton raised his eyes from the paper and beamed kindly through his glasses at his hearers. "I presume," he remarked, "the further contents of this codicil are of little interest or importance to you. It is manifest that under the conditions set forth there will be no necessity of devoting either the sum in cash or the proceeds from a sale of 'The Maples' to charity. My dear young friends, I congratulate you all."

"Oh, I think Uncle Abner was just lovely," cried Kitty.

"He's certainly done splendidly by us," agreed Ralph.

"I'll take back all I ever said about him," declared Tom. "He was a good sport and admits he was wrong, after all."

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